U.S. Department of the Interior
Bureau of Land Management
Prineville District

Bureau of Reclamation
Pacific Northwest Region

DRAFT

July 1992

# Lower Crooked River Chimney Rock Segment Management Plan and Environmental Assessment

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

**BLM-OR-PT-92-27-1792**

# United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Prineville District Office
P.O. Box 550 (185 E. 4th Street)
Prineville, Oregon 97754

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

8300

July 7, 1992

Dear Friend of the Lower Crooked River:

The Omnibus Oregon Wild and Scenic Rivers Act of 1988 directed the Bureau of Land Management in cooperation with the Bureau of Reclamation to develop a management plan for the designated portion of the Lower Crooked River (Chimney Rock Segment). This is done by developing a reasonable range of alternatives to manage the river corridor; evaluating their impacts to the physical, biological, social and economic resources, and selecting a preferred alternative to be used as a tool to help manage the river corridor. Comments and support for alternative development were received during the initial stages of the planning process through public scoping meetings, newsletter comments and work group participation.

We ask that you consider each of the identified alternatives and their associated impact analysis. The draft preferred alternative includes those management actions that the interdisciplinary team feels best resolve the identified issues.

We hope that you will take this opportunity to respond concerning whether you feel the draft preferred alternative is the best way to resolve the identified issues. If you feel the draft preferred alternative should be changed, please tell us specifically how you would change it and why. If you feel that the analysis of impacts is incomplete or inaccurate, we would also appreciate your comments.

**Please review this document and send us your written comments no later than August 28, 1992. You may also share your ideas and opinions by attending one of three public meetings to be held after public notice during August 1992.**

Send written comments to: Lower Crooked River Coordinator
Bureau of Land Management
185 East 4th Street, PO Box 550
Prineville, OR 97754

Your interest and participation in this review are greatly appreciated.

Sincerely,

James L. Hancock
District Manager

# Lower Crooked River

## Chimney Rock Segment

Draft Management Plan
and
Environmental Assessment

**U.S. Department of the Interior**

Bureau of Land Management
Prineville District

Bureau of Reclamation
Pacific Northwest Region

July 1992

# *Summary*

## A. Introduction

The Omnibus Oregon Wild and Scenic Rivers Act of 1988 directed the Bureau of Land Management in cooperation with the Bureau of Reclamation to develop a management plan for the designated portion of the Lower Crooked River (Chimney Rock Segment). This is done by developing a reasonable range of alternatives to manage the river corridor; evaluating their impacts to the physical, biological, social, and economic resources; and selecting a preferred alternative to be used as a tool to manage the river corridor. Comments and support for alternative development were received during the initial stages of the planning process through public scoping meetings, newsletter comments, and work group participation. The draft preferred alternative, as described in this document, will be edited as necessary during the public comment period then finalized and presented in the final management plan and record of decision.

The Bureau of Land Management has established boundaries for the management corridor; boundaries delineate the area to be influenced by the management plan. Boundary decisions were made on the basis of topography, location of outstandingly resources, land ownership and use patterns, and public comments. The boundary includes 2,560 acres of primarily public land along 8 miles of river resulting in 320 acres of land per river mile. The area within the boundaries is called the river corridor.

## B. Issues

Six key issues guided the development and evaluation of the Lower Crooked River management alternatives:

1. How should recreation opportunities be managed?

2. How should camping be managed to best meet public demand while protecting resource values?

3. How should public access be managed?

4. How should instream and riparian resources be managed?

5. How should upland resources be managed?

6. How should public information and education be managed?

## C. Management Alternatives

### Alternative 1

Alternative 1 is the "no action" alternative required by the National Envrironmental Policy Act (NEPA). This Alternative describes existing management. The intent would be to continue current management direction for federal lands within the wild and scenic river corridor. 10 existing campgrounds and related facilities would be managed as is without development change.

### Alternative 2

Management would be much like Alternative 1, except development of 8 campgrounds, 2 day use areas, and related access and facility development would be minimized to retain natural values. Basic site protection measures would be taken to resolve resource degradation.

### Alternative 3

This alternative focuses on increased resource protection and enhancement, centralized use areas, and facilitating for specific high use recreation opportunities. 10 campgrounds, 5 day use areas, and related access and facility development would be designed with major site protection measures in centralized use areas that protect natural values, resolve resource degradation, and encourage appropriate use in these areas.

### Alternative 4

Management would be much like Alternative 3, except most recreation opportunities would be maximized. Those activities that conflicted with the highest and best use of the river corridor would be limited. Development would be the maximum allowed under the "Recreation" classification for wild and scenic rivers. Chimney Rock, Post Pile, and Big Bend campgrounds would be developed into large scale campgrounds with increased user capacity. Big Bend campground would have full service hook-up capabilities. All vehicle access developments within campgrounds and day use areas would have oil/gravel surface.

### Alternative 5 (Draft Preferred)

The Draft Preferred Alternative primarily focuses on management actions discussed in Alternative 2 and 3. 9 campgrounds, 5 day use areas, and related access and facility development would be minimized to retain natural values. Basic site protection measures would be taken to resolve resource degradation. Specific centralized use areas would be designated and modified to adequately facilitate high use recreation opportunities such as camping and fishing.

## D. Environmental Consequences

### Summary of Overall Impacts to All Resources by Alternative

| Managing | Alt1 (NoAction) | Alt 2 | Alt 3 | Alt 4 | Alt 5 (Pref) |
|---|---|---|---|---|---|
| *Scenery* | L | +L | +L | L | +L |
| *Recreation* | L | +L | +L | +L | +L |
| *Fish* | NC | +L | +M | +M | +L |
| *Water* | L | +L | +L | +L | +L |
| *Riparian* | NC | NC | +L | +L | +L |
| *Wildlife* | L | +L | +L | +L | +L |
| *Cultural* | L | +L | +M | +M | +M |
| *Soil* | L | +L | +M | +M | +M |
| *Vegetation* | L | +L | +M | +M | +M |
| *Air* | L | NC | NC | NC | NC |
| *Socioeconomics* | NC | NC | +L | +L | +L |

\+ Beneficial
\- Adverse
NC No Change

H High
M Medium
L Low

NA Not Applicable

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# *I. Purpose and Need for Action*

## A. Introduction

Congress enacted the National Wild and Scenic Rivers Act in 1968. With this legislation, a system was established for protecting outstanding free-flowing rivers nation-wide. The National Wild and Scenic Rivers Act requires that a river be free-flowing and possess one or more "Outstandingly Remarkable Values." The Act provides for protective management and control of development for rivers included in the system.

In October 1988, the 8-mile segment of the Lower Crooked River between Bowman Dam and State Scenic Highway 27 mile marker 12 was designated by the U.S. Congress as a National Wild and Scenic River and classified as a recreational river area. The Congressional Record indicates that scenic and recreational values within the river corridor boundaries qualify as Outstandingly Remarkable.

Section 3 of the Wild and Scenic Rivers Act (Public Law 90-542, 82 Stat. 907) specifies that a comprehensive management plan will be developed for the Lower Crooked River. The Secretary of Interior, given responsibility for administering the river, delegated this duty to the Bureau of Land Management (BLM) and is mandated to have the plan completed by October, 1992. Because the Bureau of Reclamation (BOR) also manages lands within the river corridor, they are a joint partner in the coordinated planning process.

The purpose of this Environmental Assessment (EA) document (OR 056-2-6) is to provide a basis for comparing management alternatives and selecting a management plan for the Lower Crooked River. The river management plan, when completed, will satisfy requirements of the National Environmental Policy Act, the Omnibus Oregon Wild and Scenic Rivers Act of 1988, and will conform to planning objectives in the Brothers/LaPine Resource Management Plan (RMP). The RMP will later be amended to incorporate management action changes necessary to manage the Lower Crooked River.

## B. Management Planning Process

As specified in the Wild and Scenic Rivers Act and federal guidelines, the process of developing a management plan for designated rivers has several steps. Because the management plan is considered a major federal action affecting the environment, the procedures outlined in the National Environmental Policy Act (NEPA) and its set of federal guidelines also must be followed. The planning process involved the following six basic steps:

1. **Project Scoping/Public Involvement:** public meetings to identify issues, concerns, and objectives; organize a citizen's work group; and develop mailing lists of other interested parties.

2. **Resource Evaluation:** identify and evaluate river-related resources and determine outstandingly remarkable values.

3. **Identification of Management Alternatives:** clarify issues, evaluate existing river management practices, identify a range of potential management actions, and evaluate the feasibility of alternative management scenarios.

4. **Conduct an Environmental Analysis:** determine the consequences of management alternatives and evaluate the relative merits of alternatives.

5. **Prepare an Environmental Assessment:** Consolidate the above steps in an Environmental Assessment document for public review and comment.

6. **Select a Preferred Alternative and Develop a Management Plan:** identify a preferred alternative based on environmental analysis and develop a management plan and implementation strategy.

Refer to Table 1 for a further breakdown of the planning process and schedule.

## C. Public Involvement

Because of the regional popularity of the river corridor, a well rounded public involvement program was developed to make sure that the management plan would consider the concerns of daily users, local residents, landowners, Crook County, the State of Oregon, other federal agencies, and all others having a stake in how the river is managed. The public involvement program consisted of public meetings, a citizen work group, mailings to interested parties, and informational flyers, as well as ongoing informal meetings with any party requesting them.

**Public Meetings -** The National Environmental Policy Act (PL 91-190) and accompanying federal guidelines and regulations (40 CFR Parts 1500-1508 as of July 1, 1986) specify the required procedures for preparing Environmental Assessments. This includes holding scoping meetings early in the process so citizens have an opportunity to express issues and concerns important to them. Public scoping meetings were held in seven locations. These meetings also scoped issues and concerns on

**Table 1 - Planning Process and Schedule**

| | | |
|---|---|---|
| River designated as Wild and Scenic | October | 1988 |
| Interim boundary delineation | July | 1989 |
| Goal and objectives developed for plan | February | 1991 |
| Initial scoping | June-Nov | 1991 |
| Resource assessment; data collection | April-Dec | 1991 |
| Issues identified and described in detail | November | 1991 |
| Range of management alternatives developed | Jan-Mar | 1992 |
| Analyze the effect of alternatives | Mar-Apr | 1992 |
| Public review and comment of draft alternatives | April | 1992 |
| Selection of preferred alternative | May | 1992 |
| Development of the management plan | May | 1992 |
| Implementation, monitoring, and plan updates | Ongoing | |

**Table 2 - Public Scoping Meetings**

| Location | Date | Attendees |
|---|---|---|
| Redmond, Oregon | 8-14-91 | 25 |
| Prineville, Oregon | 8-15-91 | 12 |
| Eugene, Oregon | 8-19-91 | 4 |
| Fossil, Oregon | 8-20-91 | 17 |
| Crooked River Ranch, Oregon | 8-26-91 | 11 |
| John Day, Oregon | 8-27-91 | 10 |
| Portland, Oregon | 8-29-91 | 5 |

other rivers located in the central Oregon area. Table 2 represents locations and the number of people who attended each public meeting.

In addition to providing interested parties an opportunity to voice their comments and concerns, attendees were given the opportunity to review the draft resource assessment with a 30-day comment period. All seven meetings were advertised in local and regional media.

**Citizen Work Group** - To help ensure that diverse viewpoints were considered during each step of the study, a citizen work group was created. The work group served as an integral part of the planning team, helping to identify issues, determine significance of river resources, develop and refine alternatives for designation and management, and keep their fellow interest group members informed about the planning process.

The work group was composed of 10 representatives (and their alternates) from a wide range of interests concerned about the future of the river: private landowners, ranchers, water right holders, commercial outfitters, anglers, Confederated Tribes of Warm Springs, Oregon Department of Fish and Wildlife, Crook County, Prineville Chamber of Commerce, Ochoco Irrigation District, Oregon Trout, and Oregon Rivers Council.

The work group held its first meeting on May 2, 1991, and met monthly until July. After this period the work group communicated through mail correspondence. The work group became familiar with the Wild and Scenic Rivers Act and helped develop a list of issues, determine the significance of river resources, develop and refine management alternatives, and represented their constituents well.

**Interested Parties** - A list of about 50 people, agencies, and groups was compiled to make sure that other interests were kept informed of the planning process. Interested parties were mailed copies of draft planning documents, future announcements of work group or interdisciplinary team meetings, and two information flyers.

**Information Flyers** - Two Wild and Scenic information flyers (High Desert River News) were prepared and mailed to hundreds of local and regional residents, interest groups, and government agencies. The first, published in July 1991 during the issue identification process, let people know about the planning process and how they could get involved. The second, published in April, 1992 was designed to provide an update of the planning process and express the availability of final resource assessments and draft alternatives. Both infor-

mation flyers also contained information on other rivers located in the central Oregon area.

## D. Resource Evaluation and Classification

The Lower Crooked River was added to the Wild and Scenic Rivers System in 1988 by means of the Omnibus Oregon Wild and Scenic Rivers Act. The river was classified as a Recreational River because it is readily accessible by road and has a number of highly used campgrounds within the narrow corridor. The term "Recreational River" tends to be misleading because it has a common-sense connotation other than level and type of development; people often believe that recreational use is emphasized in management of recreational rivers. In reality, management is designed to conserve the values identified and maintain or enhance the existing character of the river corridor, regardless of the classification.

Congress determined that scenic and recreation resource values within the river corridor are Outstandingly Remarkable. These and other resource values on the Lower Crooked River were studied in greater detail by comparing them to similar features on other rivers in the region. A set of criteria were developed by a task force comprised of officials from BLM, U.S. Forest Service, and the State of Oregon to use in making the comparisons. The region selected for comparative analysis was the central Oregon area. This included both the Deschutes River Basin and the John Day River Basin.

The analysis confirmed the Congressional Record relating to Outstandingly Remarkable scenic and recreation resource values. The analysis also determined that the fish resource is an Outstandingly Remarkable value. These and other resources in the river corridor are described in Chapter 3. Detailed analysis of river-related resources can be found in the final resource assessment which is available at the BLM, Prineville District Office.

## E. Boundary Process

The Wild and Scenic Rivers Act (Section 3(b)) specifies that after a river is designated, the agency charged with its administration must establish detailed boundaries delineating the land area within the river corridor that will be managed under the Act. The Act specifies that the area within the corridor should not average more than 320 acres per river mile on both sides of the river, placing the boundaries an average of 1/4 mile from the river on each bank. This allows for irregular boundaries on either side of the river. Boundary delineation decisions are made on the basis of topography, location of outstanding resources, land ownership and use patterns, and public comment.

Early in the planning process, BLM held six public scoping meetings to ensure full public participation during boundary delineation. The interim National Wild and Scenic River boundary, as shown on the existing situation map, was developed as a result of these meetings. The boundary is an irregular shape to include as many of the areas as possible that contain or directly support the identified outstandingly remarkable values associated with the river. Alternative boundaries were considered but

**Table 3. Lower Crooked River Acreage by Ownership**

| County | BLM | BOR | Private | Total |
|---|---|---|---|---|
| Crook | 2,220 | 320 | 40 | 2,560 |

eliminated from further review because they were beyond the scope of the planning effort. Appendix A describes the legal description of this boundary.

The planning area contains 2,560 acres of land located entirely in Crook County. Land ownership is shown in Table 3.

## F. Related Federal, State, and Local Planning and Management Responsibilities

The Wild and Scenic River Management Act requires that a comprehensive river management plan be prepared to provide for the protection of river values. Therefore, it is necessary to insure that all entities that play a role in management of the river are included in the planning process. A variety of federal, state, and local entities have responsibilities to manage resources within the river corridor. Some of these include but are not limited to: BLM, BOR, Oregon Department of Fish and Wildlife, Oregon Department of Transportation, and Crook County. Special emphasis programs, such as noxious weed control, and fish and wildlife enhancement projects are routinely coordinated among agencies, landowners, and other affected publics. It is expected that these resource relationships be strengthened as a result of the management plan implementation.

### Bureau of Land Management (BLM)

In 1989, the BLM completed the Brothers/ LaPine Resource Management Plan, which was a comprehensive land use or Resource Management Plan (RMP) for all BLM lands and minerals in Crook County, and extending into Deschutes and Jefferson Counties. The total BLM surface acreage at the time of RMP completion was over 1,111,100 acres, including all BLM lands within the Lower Crooked River planning area. BLM manages more than 85 percent of the lands within the river corridor. The Resource Management Plan included an environmental impact statement which documented the environmental consequences of the plan as well as numerous intergovernmental relationships. The plan established land use goals and objectives for Bureau administered lands, minerals, soils and watershed, rangeland, forest and woodlands, fish and wildlife habitat, recreation, and cultural resources. It incorporated management direction for roads and access, utility and transportation corridors, fire control, noxious weed control, Areas of Critical Environmental Concern, and continued interim management of wilderness study areas. Copies of the approved Brothers/LaPine Resource Management Plan are available from the Bureau's Prineville District Office.

The Lower Crooked River corridor lies within an Area of Critical Environmental Concern (ACEC) and has specific management actions, in addition to interim Wild and Scenic River guidelines, that protects resources within its boundary. These management actions can also be found in the Brothers/LaPine Resource Management Plan.

Eight of 43 miles of State Scenic Highway 27 within the wild and scenic river corridor were designated a component of the National Back Country Byway system by the BLM in 1989. The Lower Crooked River Back Country Byway extends from the City of Prineville to State Highway 20. It is paved from Prineville for 21 miles, with the remainder an all-weather gravel road.

The BLM byways program meets some of the national demands for pleasure driving opportunities, enhances recreation experiences and helps inform visitors about the values of public lands.

The BLM, BOR, U.S. Forest Service, Oregon Department of Fish and Wildlife, Soil Conser-

*Visitors enjoy driving for pleasure on the Back Country Byway*

vation Service, and other interested groups are working to improve aquatic habitat in the Crooked River watershed. Cooperative work is continuing between these and other agencies in implementing riparian improvement projects.

The U.S. Fish and Wildlife Service administers the Endangered Species Act of 1973 (as amended). The BLM consults with that agency to obtain a formal biological opinion on appropriate courses of action when it is determined that a threatened or endangered species, or its critical habitat, may be affected by a proposed management action. Resulting decisions could mean the proposed action be modified or abandoned.

**Bureau of Reclamation (BOR)**

In February, 1992 the BOR released the Draft Prineville Reservoir Management Plan and Environmental Assessment for public review. Future management of BOR administered lands adjacent to and within the river corridor is subject to the final outcome of the Reservoir Management Plan. Currently, BOR's resource management policy is to provide a broad level of stewardship to ensure and encourage resource protection, conservation, and multiple use. Management practices and principles, in accordance with existing laws regulations, and policies are to be applied to provide for the protection of fish, wildlife, and other natural resources, cultural resources, public health and safety, public access, and a wide variety of outdoor recreational opportunities to accommo-

date the increasing public demand on Reclamation's land and water areas.

Lands under BOR jurisdiction acquired or withdrawn for the construction of Arthur R. Bowman Dam and Prineville Reservoir encompass a total of 9,109 acres. Of this total, 320 acres of flowage easement lands are located along the Lower Crooked River within the river corridor boundary. BOR proposes to manage this area as defined under the Lower Crooked Wild and Scenic River Management Plan.

The BOR is in the process of completing the environmental compliance documents required for the "Safety of Dams" proposed modification of Arthur R. Bowman Dam located directly upstream from the corridor boundary. Safety of Dams construction is currently scheduled to begin in 1993 and to be completed by 1995.

Re-allocation of the uncommitted storage space in Prineville Reservoir has been an issue that the BOR has been studying for some time. As the project is now authorized and operated, all of the active capacity can be placed under contract for irrigation use as the demand arises. No reservoir space is specifically allocated for recreation or fish and wildlife uses. The authorized minimum flow in the Crooked River below Bowman Dam is 10 cubic feet per second (cfs). However, in order to benefit the downstream fishery, Reclamation has been releasing 75 cfs below the Dam whenever there is sufficient water in the reservoir.

**The Confederated Tribes of the Warm Springs Reservation (CTWS)**

The entire Lower Crooked River planning area is located outside the Warms Springs Reservation and was ceded to the U.S. Government by the Tribes and Bands of the Middle Oregon through ratified treaty. The treaty reserves to the Indians exclusive rights of "taking fish in the streams." Tribal members also have the right of "hunting, gathering roots and berries, and pasturing their stock on unclaimed land in common with citizens". The interests of contemporary Native Americans include the protection of Indian burial grounds and other sacred sites and the perpetuation of certain traditional activities, specifically root gathering and fishing.

The Confederated Tribes of the Warm Springs are consulted by Federal, State, and local governments as recommended by the National Environmental Policy Act, the National Historic Preservation Act of 1966 (as amended), and as required by the Archaeological Resources Protection Act of 1979 (as amended). The BLM, BOR, and State also contact and consult with the appropriate Tribal representatives and Bureau of Indian Affairs agencies in the early stages of any project or activity planning on BLM, BOR, or State administered lands that may affect Tribal interests, treaty rights, or traditional use areas within Ceded Lands.

**Oregon Department or Fish and Wildlife (ODFW)**

The ODFW is responsible for the management and wise use of the State's fish and wildlife resources. The Department is charged with maintaining optimum numbers of indigenous fish and wildlife, and to ensure that no species are threatened with extinction. The Department is responsible for developing and administering fish and wildlife regulations. The ODFW, BLM, BOR, and other interested groups work cooperatively in riparian habitat enhancement projects, fish and wildlife enhancement projects, and Crooked River basin planning efforts. ODFW routinely monitors the Lower Crooked River angling effort and harvest, as well as hunter effort and harvest.

### Oregon Department of Transportation (ODOT)

The ODOT is responsible for planning, designing, reconstructing, signing, and maintaining State highways for the safety and use by the public. ODOT is also responsible for the management of motor vehicle use on State Highways. These responsibilities include State Scenic Highway 27, of which a portion is located within the Lower Crooked Wild and Scenic River corridor. ODOT must prepare a section 4(f) evaluation under the Federal-Aid Highway Act of 1968 for any federally funded highway project which requires the use of any publicly owned land used as a recreation area, beyond the existing highway improvement. Since the Lower Crooked Wild and Scenic River is classified as a recreation river, it has been determined that the 4(f) requirement is applicable within its boundaries. Permits are required for all access points along the highway.

### Oregon Water Resource Department (WRD)

The WRD is responsible for management and allocation of the State's water resources. The Water Resource Commission typically develops policy through the preparation of basin plans for each of Oregon's 18 river basins. Through basin plans, the WRD classifies streamflow for certain purposes, such as domestic use, industry, municipal, recreation, or irrigation. The plans are adopted as administrative rules which reflect how water is currently used, and how its future use will be allocated. Three State departments may apply for these instream rights: Parks and Recreation, Fish and Wildlife, and Environmental Quality. Once granted, the instream water right is held by WRD in trust for the people of Oregon.

### Division of State Lands (DSL)

DSL is responsible for the management of the beds and banks of navigable waterbodies. DSL regulates removal, fill, or alteration of 50 cubic yards or more of material in all waterways (including lakes and wetlands) in the State. The DSL is also responsible for managing certain lands for their maximum benefit to the common school fund, consistent with best conservation practices.

### Department of Environmental Quality (DEQ)

The DEQ is responsible for the implementation of the Statewide Water Quality Management Plan, which establishes standards of water quality for each of WRD's 18 basins in Oregon. Beneficial uses of rivers and streams that are to be protected by DEQ are: public, private, and industrial water supplies, irrigation, livestock watering, anadromous fish passage, salmonid rearing and spawning, resident fish and aquatic life, wildlife and hunting, fishing, boating, and aesthetic quality. Dissolved oxygen is to be kept to the highest possible levels. Temperature, bacteria, dissolved chemical substances, and toxic material are to be maintained at the lowest possible levels. The DEQ anti-degradation policy states that high quality waters are to be protected from degradation unless the Environmental Quality Commission finds it necessary to make an exception based on economic or social needs. DEQ also maintains water quality monitoring stations throughout Oregon.

### Oregon State Police (OSP)

The Department of State Police was created to serve as a rural patrol and to assist local law enforcement agencies. This agency is empowered to enforce all Oregon statutes without limitation by county or other political subdivision. State Police activities are coordinated with local and Federal law enforcement agencies and assisted by the general public. For example, the TIP Program (Turn in Poachers) has been established in cooperation with the Oregon Department of Fish and Wildlife and the Oregon Hunter's Association. This program is

designed to involve citizens in reporting wildlife law violations.

**Crook County**

The Omnibus Oregon Wild and Scenic Rivers Act of 1988, the Federal Land Policy and Management Act of 1976, and the National Environmental Policy Act of 1969 (as amended) all encourage or mandate intergovernmental coordination, consultation and, where possible, plan consistency. Since the Wild and Scenic Rivers Act envisioned a high reliance on local comprehensive plans to achieve the objectives of the Act, a review and analysis of the adequacy of the existing plans for Crook County was critical.

The Crook County comprehensive plan was acknowledged by the Land Conservation and Development Commission (LCDC) in 1978 when the original plan was adopted. The required periodic review and amendment process is currently underway and is expected to be completed by January 1993. The BLM and BOR are coordinating efforts with Crook County to ensure consistency between planning efforts. Expected amendments or revisions may include changes in policy statements which have been superseded by Federal or State law. The existing plan acknowledges the areas recreation values and protects scenic resources throughout the corridor. The absence of growth and limited private lands within the corridor has allowed the rims to remain free from development. In summary, the current Crook County plan provides a moderate degree of protection for river-related resource values.

Crook County provides year round enforcement of state and local laws within the corridor. They also provide enforcement of some federal laws and regulations within the river corridor through written law enforcement agreements with the BLM and BOR.

**Ochoco Irrigation District (OID)**

Although ultimately managed by the BOR, the OID manages flow releases from Prineville Reservoir. The District is key in ensuring that water right holders and users receive their water allotment. OID works closely with the BOR, BLM and ODFW to ensure that river-related resources are not impacted.

**Prineville/Crook County Chamber of Commerce**

The Prineville/Crook County Chamber of Commerce has identified tourism and recreation as increasing sources of income for the local community. The Chamber helps promote tourism and provides a vital link for visitors from outside the local area. As a result of the designated Back Country Byway the BLM, BOR, and Prineville Chamber of Commerce would enter into a memorandum of understanding to better manage vehicle touring on Highway 27 within the river corridor.

# II. Alternatives

## A. Introduction

This chapter presents and compares the five alternatives developed during the planning process. The alternatives each present a different comprehensive strategy for managing the Lower Crooked River corridor. Management actions that are common to all alternatives are also presented. The Draft Preferred Alternative was developed as a result of public involvement and professional analysis of the other alternatives.

Before describing the alternatives, this chapter discusses six key issues that formed the basis for developing the alternatives and describes alternatives that were considered during the planning process but rejected as a result of being outside the scope of the planning effort. Management goals and desired future conditions that provide sideboards for management actions within each alternative are also discussed.

## B. Issues

Six key issues guided the development and evaluation of Lower Crooked River management alternatives. These issues were established during the initial stages of work group participation and later during public scoping meetings. The six key issues presented in this section were formulated by consolidating similar issues into like categories after ensuring that issues were within the legal authority of the managing agencies, that all issues had a variety of options, and that the issues had some kind of public controversy.

**Issue 1 - How should recreation opportunities be managed?**

Due to the limited user capacity of the river corridor, there is a high degree of competition among various users resulting in use conflicts, decreased levels of visitor experience, and resource degradation. Recreation users are concerned about increasing levels of use and its impact on their ability to recreate in the corridor in the future. In addition, users have different perspectives on allowable recreation opportunities, however, all are in agreement that the corridor should remain in its semi-primitive state without further impacts to surrounding resources.

Many users are not aware of current rules and regulations within the river corridor. Users indicate that identification of use sites and better control of local, state, and federal laws would decrease resource and user conflict.

**Issue 2 - How should camping be managed to best meet public demand while protecting resource values?**

During peak visitor use months, there is a high degree of competition for campsites and day use areas within the river corridor. Some established campsites are being damaged by heavy use and are in need of rehabilitation or closure. In some areas, there are not enough campsites or basic site protection facilities to accommodate the present level of use.

Recreation users are split down the middle regarding the level of facility development that should occur in the river corridor. Some desire facilities that cater to their traditional camping needs (toilets, waste water sumps, fire grates and designated use sites) while other believe

that in order to retain the present scenic value within the corridor no more facilities should be installed. Recreation users desire the continued ability to camp and/or enjoy day use opportunities in all of the existing campgrounds in the river corridor.

Most users are not opposed to paying overnight camping fees but are concerned about increasing fee rates in the future. Currently, fees do not provide enough funding for adequate resource protection, visitor services, facility development, operation, maintenance, and trash collection within the river corridor.

**Issue 3 - How should public access be managed?**

With easy access along State Highway 27, the river corridor facilitates valuable and convenient vehicle access for fishing, camping, and a variety of other recreation activities. Recreation visitors desire assured provision of public access and appropriate access facilities for use safety. Although many users believe that current vehicle access should be preserved, most are in agreement that access to fragile areas and areas experiencing heavy degradation should be closed off and rehabilitated. All existing vehicle access roads are used heavily during the peak use months and are in need of improvement and/or rehabilitation. Illegal off-road vehicle use persists as a major problem throughout the river corridor.

Non-motorized use trails existing primarily in the riparian area are used for river access and wildlife observation. These trails network unnecessarily and do not adequately protect resources from impacts resulting from uncontrolled use. Many users desire developed trails that could be used to redirect use and enhance visitor experience. No agency developed trails exist within the river corridor. Most users prefer closing off vehicle access to the west side of the river to provide an opportunity for more primitive experiences while protecting scenic values.

**Issue 4 - How should instream and riparian resources be managed?**

Concern has been voiced regarding the adequacy of existing local, state, and federal mechanisms to provide long-term protection for instream and riparian resources on the Lower Crooked River within the corridor. While the river segment itself is free-flowing, instream and riparian resources remain dependent upon flow releases through Bowman Dam (located outside of the river corridor boundary) from Prineville Reservoir. Although water quality is greatly impacted by upstream watershed management, problems that effect water quality within the river corridor itself remain in the form of soil erosion, siltation, and turbidity. Current flow releases continue to degrade fish habitat and reduce fish populations.

Riparian health is also in degrading condition as a result of flow release management. Lack of managed flow releases in excess of 1,000 cubic feet per second (cfs) contributes to the inability to provide adequate bank building. In addition, unstable campsites and uncontrolled recreational activities in the riparian area has significantly contributed to soil erosion and vegetation loss.

**Issue 5 - How should upland resources be managed?**

Preservation of scenic quality is of concern, especially given the naturalness of the steep slopes that enclose the river. Vegetation management practices that effect scenic quality such as fire, mosaic juniper thinning, and use of chemicals are all subject to differing points of concern. Most individuals question the ability of existing mechanisms to respond in a way that will ensure long-term protection of upland resources.

Another area of concern in the uplands is the increase in recreation use and how it has resulted in increased wildlife disturbance and displacement. Poaching and casual shooting also contribute to this problem.

**Issue 6 - How should public information and education be managed?**

Various resource problems related to visitor use have plagued the river corridor without any specific effort to resolve them. Impacts such as litter, vandalism, firewood cutting, off-road vehicle use, and wildlife disturbance have led to a number of complaints from the visiting public and other managing agencies. Except for signs and one brochure dictating rules and regulations, no comprehensive or coordinated plan for informing and educating the public has been developed or implemented.

## C. General Management Goals and Desired Future Conditions

**Management Goals:**

The overall goal of the management plan for the river corridor is to meet the intent of the Wild and Scenic Rivers Act by maintaining the current character of the area, and provide long-term protection and enhancement of its outstandingly remarkable scenic, recreation and fishery resource values.

Two additional goals were developed as a result of public involvement. They include:

1. Provide for appropriate recreational use and appropriate public access while maintaining the wild and scenic nature of the river.

2. Foster cooperation among adjacent landowners, managing agencies, and the public to manage and enhance the outstandingly remarkable river values.

**Desired Future Conditions:**

Desired future conditions present a vision of the desired future state of a specific area. The desired future conditions that follow were developed for the Lower Crooked River area after public input by work group and interdisciplinary team members. They provide a focus for alternative development.

**Scenic Resources** - A combination of appropriately screened developments, varied plant communities, seasonal river flows supporting an abundance of wildlife, and varied depths of undisturbed canyon walls leave this corridor in excellent condition for the viewing pleasure of campers and those travelling along State Scenic Highway 27.

**Recreation** - The corridor experiences continued use and enjoyment of a variety of Roaded Natural recreation opportunities that are compatible with the protection and enhancement of the river's natural resources.

**Geology/Minerals** - Geologic formations that support scenic river values are protected. Mineral extraction continues to be in compliance with State and County ordinance.

**Prehistoric, Historic, and Traditional** - The river corridor has been surveyed for cultural resources. Preservation through protection, enhancement and interpretation of cultural sites and recognized traditional use locations continue to be managed for their values and religious importance.

**Hydrologic** - Water quality and quantity maximize other resource values and exceed Federal and State standards and continues to fulfill agricultural and domestic need. Unique hydrologic features that support scenic river values are protected and enhanced.

**Fishery** - Seasonal flows support quality habitat for fish and aquatic organisms. The habitat is in optimum condition for natural diverse fish production.

**Wildlife** - Native wildlife populations are healthy and abundant. The habitat is in optimum condition for natural diverse wildlife production.

**Botanical/Ecological** - Native upland and riparian vegetation communities are in outstanding condition lending to significant biological diversity within the corridor.

## D. Alternatives Considered but Eliminated From Further Review

Alternatives identified during initial scoping and alternative development were examined for feasibility. Some of these alternatives no longer seemed to be useful or fell outside the scope of the planning effort. The most important of these are identified below.

### Boundary Delineation

The joint managing agencies considered a reduction in the southernmost boundary, downriver 1/2 of a mile, as a result of concerns related to future dam construction and maintenance. Although the reduction in boundary would facilitate easy future maintenance, the change would remove protection of highly scenic basalt cliffs and eliminate protection of important fish habitat, particularly resident fish spawning areas. The interdisciplinary team agreed that the boundary change should not be recommended. Congress would have to change this terminal boundary.

Comments during the planning process also suggested the boundary should be expanded to include more land than is authorized in the Wild and Scenic Rivers Act in order to better protect the natural qualities of the area. These actions would have included an extension of the northernmost boundary 5 miles north to Dry Creek and enlarging the boundary 1 mile to the south of the dam to include an interesting volcanic maar. It is possible to request Congress to grant these increases based on protection of outstandingly remarkable values. These actions were not pursued further because there are no known outstandingly remarkable values in the proposed expansion areas. Therefore, they do not fall within the intent of the Wild and Scenic Rivers Act.

### Development Extremes

Alternatives that would change the Lower Crooked River corridor into a high density urban park on one hand, or a wilderness area on the other hand have been determined to be unreasonable and have be excluded from further review.

## E. Description of the Alternatives

Many alternatives for managing the Lower Crooked River corridor could be developed which would adequately provide the protection of river values required by the Wild and Scenic Rivers Act. Together as a whole, the alternatives represent a reasonable range that address issues identified during the planning process. This chapter presents and compares the five alternatives developed during the planning process in detailed comparison format. Themes (general goals) have been developed for each of these alternatives and are described below.

*Alternative Themes*

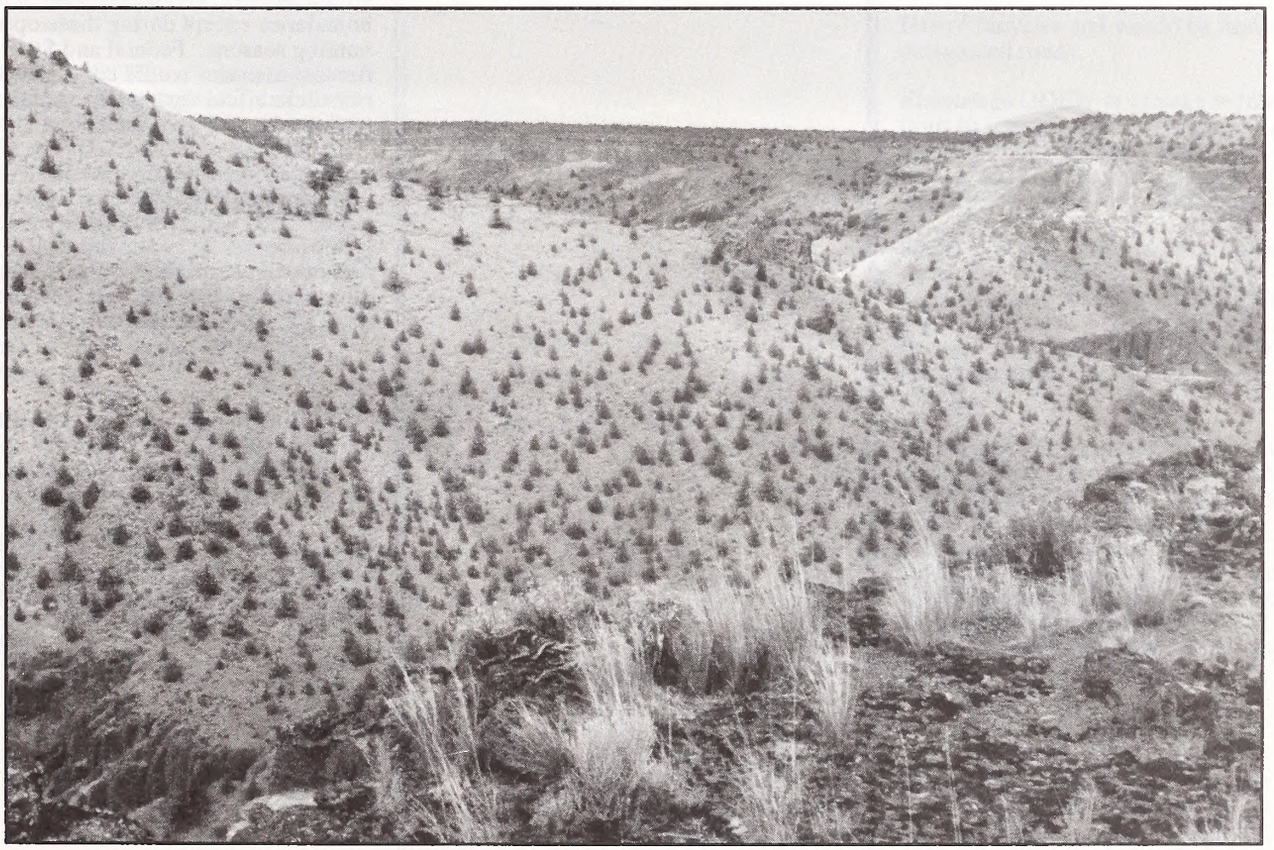
**Alternative 1 (No Action)** Continue current management direction for federal lands within the wild and scenic river corridor.

**Alternative 2** Management would be much like Alternative 1, except campground, day use, and access development would be minimized to retain natural values. Basic site protection measures would be taken to resolve resource degradation.

**Alternative 3** This alternative focuses on increased resource protection and enhancement, centralized use areas, and facilitating for specific high use recreation opportunities. Site protection measures in centralized use areas would protect natural values, resolve resource degradation, and encourage appropriate use in these areas.

**Alternative 4** Management would be much like Alternative 3, except most recreation opportunities would be maximized. Those activities that conflicted with the highest and best use of the river corridor would be limited. Development would be the maximum allowable under the "Recreation" classification for wild and scenic rivers.

**Alternative 5 (Draft Preferred)** The Draft Preferred Alternative primarily focuses on management actions discussed in Alternatives 2 and 3. Development would be minimized to retain natural values. However, specific centralized use areas would be designated and modified to adequately facilitate high use recreation opportunities such as camping and fishing.



*Scattered juniper on upland slopes as seen from east rim*

| Issue 1 | Alternative 1 (No Action) | Alternative 2 |
|---|---|---|
| **How should recreation opportunities be managed?** | **Recreation Opportunities:** Recreation opportunities that exist within the corridor would be available throughout most of the year. Motorized vehicle use would remain limited to designated roads and firewood cutting would not be allowed. Regulations prohibiting discharge of firearms in campgrounds would continue. Other recreation activities are regulated through current local, state, and federal regulations. Recreation opportunities within the corridor include: fishing, hiking, camping, picnicking, boating, swimming, biking, horseback riding, rockhounding, hunting, wildlife observation, photography, and vehicle touring. Refer to Appendix C for recreation survey data. | **Recreation Opportunities:** Year round recreation opportunities would continue to be provided. In order to reduce resource degradation and limit user conflict, the following actions would take place. All other recreation opportunities remain managed as described under Alternative 1.<br><br>Existing non-motorized multiple use trails within the riparian and upland areas experiencing heavy degradation would be re-routed and rehabilitated.<br><br>Use of bicycles and horses would be limited to designated roads and trails on the east side. The west side would be available for open country horse use but closed to bicycles.<br><br>Encourage ODFW to change regulations to limit discharge of firearms and hunting to official state Waterfowl, Big Game, and Upland Game seasons. BLM/BOR would also establish a supplementary rule (43 CFR, part 8360) to prohibit discharge of firearms within the wild and scenic river boundaries except during these open hunting seasons. Federal and State firearm use rules would continue to remain in affect during these open seasons.<br><br>Implement an open fire closure between June 1 and October 15 on all public lands within the river corridor. Campfires would be limited to designated overnight campgrounds all other times of the year. Users would be required to provide their own firewood. |

| Alternative 3 | Alternative 4 | Preferred Alternative |
|---|---|---|
| **Recreation Opportunities:** Year round recreation opportunities would continue to be provided. In order to reduce resource degradation and limit user conflict, the following actions would take place. All other recreation opportunities remain managed as described under Alternative 1.<br><br>Designate non-motorized multiple use trails within the riparian and upland areas and encourage their use. Re-route and rehabilitate all unnecessary trail networking. Other trails would be developed as described under the Issue 3 to protect resources, promote appropriate use, and create an awareness of public land resources.<br><br>Horses would be limited to designated roads and trails on the east side and encouraged to use user developed trails on the west side. Horse access areas would be identified at the Upper Palisades, the Rim Trail Trailhead, and Upper Poison Butte.<br><br>Bicycles would be limited to designated roads.<br><br>Encourage ODFW to change regulations to limit discharge of firearms and hunting to official state Waterfowl, Big Game, and Upland Game seasons. BLM/BOR would also establish a supplementary rule (43 CFR, part 8360) to prohibit discharge of firearms within the wild and scenic river boundaries except during these open hunting seasons. Federal and State firearm use rules would continue to remain in affect during these open seasons.<br><br>Implement a fire closure between June 1 and October 15 on all public lands within the river corridor. Campfires would be limited to designated overnight campgrounds within developed fire rings or metal fire pans all other times of the year. Users would be required to provide their own firewood. Rock fire rings would not be allowed. | **Recreation Opportunities:** Same as Alternative 3, except horse use within the corridor would be limited to Highway 27. Horse access areas would not be developed.<br><br>Encourage ODFW to prohibit the discharge of firearms, hunting, and trapping within the river corridor. BLM/BOR would also pursue a supplementary rule (43 CFR, part 8360) that prohibits discharge of firearms within the wild and scenic river corridor boundaries. | **Recreation Opportunities:** Year round recreation opportunities would continue to be provided. In order to reduce resource degradation and limit user conflict, the following actions would take place. All other recreation opportunities remain managed as described under Alternative 1.<br><br>Designate and stabilize non-motorized river access trails on the east side within the riparian areas. Designate one upland access trail on the east side. Re-route and rehabilitate all unnecessary trail networking. Other trails would be developed as described under Issue 3 to protect resources, promote appropriate use and create an awareness of public land resources.<br><br>Horses would be limited to designated roads and trails on the east side and encouraged to use user developed trails on the west side. Horse access areas would be identified at Upper Palisades, Rim Trail Trailhead, and Upper Poison Butte.<br><br>Use of bicycles and would be limited to designated roads.<br><br>Encourage ODFW to change regulations to limit discharge of firearms and hunting to official state Waterfowl, Big Game, and Upland Game seasons. BLM/BOR would also establish a supplementary rule (43 CFR, part 8360) to prohibit discharge of firearms within the wild and scenic river boundaries except during these open hunting seasons. Federal and State firearm use rules would continue to remain in affect during these open seasons.<br><br>Implement a fire closure between June 1 and October 15 on all public lands within the river corridor. Campfires would be limited to designated overnight campgrounds within developed fire rings or metal fire pans all other times of the year. Users would be required to provide their own firewood. Rock fire rings would not be allowed. |

| Issue 1 | Alternative 1 (No Action) | Alternative 2 |
|---|---|---|
| **How should recreation opportunities be managed? (cont)** | **Visitor Experience:** Existing Roaded Natural experience opportunities would be maintained between the east side of the river and the east side of Highway 27, including the Quarry area. Semi-Primitive Non-Motorized recreation opportunities would be maintained on the west side of the river and east of Highway 27, except in the Quarry area.<br><br>**Commercial Use:** Commercial use of the river corridor would be managed by the BLM. Special land use requests and concessions would require a special land use permit. Commercial guides and outfitters would be required to obtain a Special Recreation Use Permit. The number of permitted guides and outfitters would remain discretionary dependent upon use levels and their impacts on outstandingly remarkable values. | **Visitor Experience:** Same as Alternative 1, except existing Roaded Natural experience opportunities would be maintained using basic site protection measures in those areas experiencing heavy degradation. Conflicts between recreationists would be minimized by encouraging appropriate use of the resources. Semi-Primitive Non-Motorized experience opportunities would be maintained on the west side of the river and east of Highway 27. The Quarry would be closed to vehicle access.<br><br>**Commercial Use:** Same as Alternative 1. |

| Alternative 3 | Alternative 4 | Preferred Alternative |
|---|---|---|
| **Visitor Experience:** Existing Roaded Natural experience opportunities would be maintained using major site protection measures in those areas experiencing heavy degradation. Conflicts between recreationists would be minimized by designating more specific use areas and utilizing interpretive efforts. Semi-Primitive Non-Motorized experience opportunities would be maintained on the west side of the river and east of Highway 27, except in the Quarry Area. | **Visitor Experience:** Same as Alternative 3.. | **Visitor Experience:** Existing Roaded Natural experience opportunities would be maintained using basic site protection measures to those areas experiencing heavy degradation. Conflicts between recreationists would be minimized by designating more specific use areas and utilizing interpretive efforts. Semi-Primitive Non-Motorized experience opportunities would be maintained on the west side of the river and east of Highway 27. The Quarry Area would be closed to vehicle access. |
| **Commercial Use:** Same as Alternative 1, except the number of guides and outfitters would be limited to the 1991 historical use ceiling of six permitted guides and outfitters. | **Commercial Use:** Exclude commercial use within this corridor. | **Commercial Use:** Commercial use of the river corridor would be managed by the BLM. Special land use requests and concessions would require a special land use permit. Commercial guides and outfitters would be required to obtain a Special Recreation Use Permit. The number of permitted guides and outfitters would remain discretionary dependent upon use levels and their impacts on outstandingly remarkable values. |

| Issue 2 | Alternative 1 (No Action) | Alternative 2 |
|---|---|---|
| **How should camping and day use be managed to best meet public demand while protecting resource values?** | **Facility Development:** Existing campgrounds and facilities would be managed the same as shown in Appendix B. Maintenance would continue to resolve vandalism and user/ resource conflict problems. Current campground areas include: Castle Rock, Stillwater, Greenwood, Lone Pine, Lower Palisades, Chimney Rock, Cobble Rock, Post Pile, Poison Butte, and Big Bend. | **Facility Development:** Castle Rock, Stillwater, Lone Pine, Lower Palisades, Chimney Rock, Post Pile, Poison Butte, and Big Bend campgrounds would be developed with basic site protection measures taken. These areas would receive upgrades such as pit toilets, picnic tables, trash cans, sink water holes, and designated road networks and campsite areas as shown in Appendix B. Greenwood and Cobble Rock would be developed as day use areas with basic site protection measures and facilities as defined in Appendix B. Existing sites within the riparian area experiencing heavy degradation would be rehabilitated or closed, if necessary, to provide resource protection. These sites could be re-opened once rehabilitation efforts stabilize the disturbed areas. Future facilities would be developed in upland areas. Existing facilities at Chimney Rock would be rehabilitated. Overnight camping would be limited to designated campgrounds only. Camping in day use areas and on the west side of the river would not be permitted. Use areas outside of designated campgrounds and day use areas experiencing significant degradation would be closed off and rehabilitated. |
| | **Barrier Free Facilities:** New facilities would consider barrier free access as law requires. Fishing opportunities, directly adjacent to the campgrounds would remain fairly inaccessible to severely disabled users. Undeveloped challenge level 2 access is available for fishing in Stillwater. | **Barrier Free Facilities:** Install challenge level 2 barrier free facilities at all campgrounds and day use areas listed above. In Chimney Rock campground, harden one access path to the river with compacted gravel to facilitate challenge level 1 barrier free fishing access. Challenge level 2 fishing access would remain available in Stillwater campground. |

| Alternative 3 | Alternative 4 | Preferred Alternative |
|---|---|---|
| **Facility Development:** Greenwood and Cobble Rock would be managed for primitive camping with facilities such as pit toilets, garbage cans, picnic tables and designated use sites. All other campgrounds would be developed as shown in Appendix B with campspurs, walk-in campsites, vehicle barriers and other resource protection devices. Water would be provided at Castle Rock, Stillwater, Lower Palisades, Chimney Rock, Post Pile and Big Bend. Small day use areas would be developed at the trailhead near the Quarry Area, Rim Trail Trailhead, Upper Lone Pine, Upper Palisades Flat, and Upper Poison Butte with facilities such as parking areas, picnic tables, trash cans, and interpretive signs. Existing sites within the riparian area experiencing heavy degradation would be rehabilitated or closed, if necessary, to provide resource protection. These sites could be re-opened once rehabilitation efforts stabilize the disturbed areas. Future facilities would be developed in upland areas. Existing facilities at Chimney Rock would be rehabilitated. Overnight camping would be limited to designated campgrounds only. Camping in day use areas and on the west side of the river would not be permitted. Use areas outside of designated campgrounds and day use areas experiencing significant degradation would be closed off and rehabilitated. | **Facility Development:** Same as Alternative 3, except Stillwater, Lower Palisades, Chimney Rock, Post Pile, and Big Bend would be developed to large-scale campgrounds with group sites needing reservations, walk-in campsites, and levelled tent sites. All campgrounds and day use areas would have oil and gravel vehicle access surface. Existing sites within the riparian area that are experiencing heavy degradation would be closed to camping and rehabilitated. All campgrounds would have water provided. Chimney Rock would be expanded by 20 walk-in campsites by extending a foot bridge across the Lower Crooked River. Full service hook-up, a gray water dump station, and a fish cleaning station would be provided at Big Bend campground. | **Facility Development:** Castle Rock, Stillwater, Lone Pine, Lower Palisades, Chimney Rock, Post Pile, Cobble Rock, Poison Butte, and Big Bend campgrounds would be redesigned and developed with basic site protection measures taken. These areas would receive upgrades such as pit toilets, picnic tables, trash cans, sink water holes, and designated road networks and campsite areas as shown in Appendix B. Campground expansion could occur if site monitoring and visitor use data indicate the need. Greenwood, Upper Lone Pine, Upper Palisades, Upper Poison Butte, and the Rim Trail Trailhead would be developed as day use areas with basic site protection measures and facilities as defined in Appendix B. Existing sites within the riparian area experiencing heavy degradation would be rehabilitated or closed, if necessary, to provide resource protection. These sites could be re-opened once rehabilitation efforts stabilize the disturbed areas. Future facilities would be developed in upland areas. Existing facilities at Chimney Rock would be rehabilitated. Overnight camping would be limited to designated campgrounds only. Camping in day use areas and on the west side of the river would not be permitted. Use areas outside of designated campgrounds and day use areas experiencing significant degradation would be closed off and rehabilitated. |
| **Barrier Free Facilities:** Install challenge level 2 barrier free facilities in Greenwood and Cobble Rock campgrounds. All other campgrounds and day use areas within the corridor would have challenge level 1 barrier free facilities incorporated into their design. Develop an easily accessible barrier free trail with asphalt surface in the Chimney Rock campground area and build a small dock for bank fishing. Challenge level 2 fishing access remains available within Stillwater campground. | **Barrier Free Facilities:** Same as Alternative 3, except Chimney Rock campground would be redesigned to facilitate easy access to all facilities. Challenge level 2 fishing access trails with compacted gravel surface would be constructed at Stillwater, Lone Pine, Lower Palisades, Post Pile, and Big Bend. | **Barrier Free Facilities:** Install challenge level 1 barrier free facilities at Chimney Rock and Big Bend. Two campsites would be developed in each of these campgrounds to facilitate easy access within the use areas and to toilet facilities. An easy access, asphalt surface river access trail with a small fishing dock would be developed within Chimney Rock. All other campgrounds and day use areas within the corridor would have challenge level 2 barrier free facilities incorporated into their design. Challenge level 2 fishing access would remain available within Stillwater campground. |

| Issue 2 | Alternative 1 (No Action) | Alternative 2 |
|---|---|---|
| **How should camping and day use be managed to best meet public demand while protecting resource values? (cont)** | **Identification of Use Sites:** Leave campgrounds as currently identified (Big Bend is the only campground without a recreation site sign). All use sites within Chimney Rock are identified. Day use parking would not be restricted within the campgrounds.<br><br>**Fees:** Continue charging fees for overnight camping in those campgrounds signed as a U.S. Fee Area. These include: Castle Rock, Lower Palisades, Chimney Rock, and Post Pile. | **Identification of Use Sites:** Install facility and boundary signs at all campgrounds and day use areas listed above. All of these areas would be identified with recreation site signs (install recreation site sign at Big Bend). Identify and develop day use parking areas and use sites within each campground and day use area as shown in Appendix B.<br><br>**Fees:** Overnight camping fees would be required at Stillwater, Lower Palisades, Chimney Rock, Post Pile, Poison Butte, and Big Bend campgrounds. |

| Alternative 3 | Alternative 4 | Preferred Alternative |
|---|---|---|
| **Identification of Use Sites:** Same as Alternative 2, except install facility and boundary signs at all campgrounds and day use areas listed above. All campgrounds and day use areas would have recreation site signs installed. Day use parking would be restricted to designated areas. | **Identification of Use Sites:** Same as Alternative 3. | **Identification of Use Sites:** All campgrounds and day use areas would be identified with appropriate recreation site signs. Signs would be installed within these areas to ensure appropriate use of facilities and use areas as shown in Appendix B. |
| **Fees:** Overnight camping fees would be required at all ten campgrounds. | **Fees:** Same as Alternative 3. | **Fees:** Overnight camping fees would be required at Castle Rock, Stillwater, Lone Pine, Lower Palisades, Chimney Rock, Cobble Rock, Post Pile, Poison Butte, and Big Bend campgrounds. |

| Issue 3 | Alternative 1 (No Action) | Alternative 2 |
|---|---|---|
| **How should public access be managed?** | **Highway/Campground Access:** Vehicle access to campgrounds along Highway 27 would remain undeveloped. Campground network roads and parking areas would continue to be maintained in their current condition as shown in Appendix B. Day use parking in pullouts along the highway is regulated through existing state traffic laws. Gravel would be periodically applied in serious impact areas. | **Highway/Campground Access:** Redesign and harden all campground and day use entrance road aprons with gravel as shown in Appendix C. Campground network roads would be redesigned and surfaced with gravel to reduce resource damage, congestion, and safety problems and would consider changes in drainages and user need as shown in Appendix B. Designated roads outside of campgrounds and day use areas would be surfaced with gravel where needed to protect resources. Unnecessary access roads within the corridor would be closed and rehabilitated. The Quarry area would be closed to vehicle access. An administrative gate would be installed across the dam access road, south of the cement pad, within Big Bend campground. This gate would be opened to public access between October 1 and May 1 each year.<br><br>Day use parking for fishing and sightseeing access would continue all along Highway 27. Pullout areas and adjacent river access trails experiencing heavy use and degradation would be stabilized using basic site protection measures and surfaced with gravel where needed as shown in Appendix C. Unnecessary trails would be closed and rehabilitated. |

| Alternative 3 | Alternative 4 | Preferred Alternative |
|---|---|---|
| **Highway/Campground Access:** Same as Alternative 2, except all campground and day use entrance road aprons would be redesigned and hardened with asphalt. All designated roads and campspurs would be graveled. Vehicle barriers such as treated posts and large rocks would be installed along sections of the highway adjacent to campgrounds to discontinue unnecessary campground and day use area access. An administrative gate in Big Bend campground would be installed to discontinue vehicular access up to the base of the dam on a year-round basis.<br><br>Specific day use parking and pullout areas would be identified along Highway 27 and paved with asphalt as shown in Appendix C. These areas would be widened and appropriately signed to encourage use. Other pullout areas and adjacent river access trails experiencing heavy use and degradation would be stabilized using basic site protection measures and surfaced with gravel where needed. | **Highway/Campground Access:** Same as Alternative 3, except all network roads within campgrounds and day use areas would be surfaced with oil and gravel. | **Highway/Campground Access:** Redesign and harden all campground and day use entrance road aprons with asphalt. Vehicle barriers such as treated posts and large rocks would be installed along sections of the highway adjacent to campgrounds to discontinue unnecessary campground and day use area access. Campground network roads and campspurs would be redesigned and surfaced with gravel to reduce resource damage, congestion, and safety problems and would consider changes in drainages and user need. Designated roads outside of campgrounds and day use areas would be surfaced with gravel where needed to protect resources. Unnecessary access roads within the corridor would be closed and rehabilitated. The Quarry area would be closed to vehicle access. An administrative gate would be installed across the dam access road, south of the cement pad, within Big Bend campground. This gate would be opened to vehicle access between October 1 and May 1 each year.<br><br>Day use parking for fishing and sightseeing access would continue all along Highway 27. Specific day use parking and pullout areas would be identified along Highway 27 and paved with asphalt as shown in Appendix C. These areas would be widened and appropriately signed to encourage use. Other pullout areas and adjacent river access trails experiencing heavy use and degradation would be stabilized using basic site protection measures and surfaced with gravel where needed. Unnecessary trails would be closed and rehabilitated. |

| Issue 3 | Alternative 1 (No Action) | Alternative 2 |
|---|---|---|
| **How should public access be managed? (cont)** | **River Access:** Vehicle access to areas directly adjacent to the river would take place primarily within and adjacent to existing campgrounds and various pullouts along the highway. River access by foot occurs from these areas. Many user developed trails parallel both sides of the river. Direct vehicle access into the river is discouraged as vehicles are limited to existing roads within the corridor. | **River Access:** River access areas experiencing significant degradation from vehicle or foot traffic would be re-routed and rehabilitated. Other river access areas would be maintained to reduce further degradation. Specific areas would be designated for boat launching/landing at Big Bend, Lone Pine, and just south of the Chimney Rock area. Except for boat launching, vehicles would not be allowed to enter the river. Small boating devices such as rubber inflatables would be allowed to enter the river at any point by means of walk-in access. The lower dam area would be closed to vehicle access from October 1 to May 1 each year. |
| | **West Side Access:** The west side of the corridor would remain relatively inaccessible by vehicle. Access is known to have occurred across the river from Lone Pine, Cobble Rock, and Big Bend. BLM would discourage vehicle use within the river. The west side is visited moderately during the year by hikers, fishermen, and floaters. Very little access occurs from the west side rim. | **West Side Access:** No vehicle access would be allowed on the west side. Direct vehicle river access areas that facilitate fording of the river would be re-routed and rehabilitated. The west side would be accessible only by non-motorized traffic across the river or from the rim. No trail development would occur. |
| | **Trail Access:** No trail development would occur. Trail networks would continue to remain user defined. | **Trail Access:** User developed trails on the east side of the river that show significant impact to the riparian or upland environment would be re-routed and rehabilitated. Foot trails would be designated from campgrounds and day use parking areas specially designed for river access and to reduce further degradation within the riparian area. The west side user developed trails would remain in their primitive state and be limited to foot and horse traffic only. |

| Alternative 3 | Alternative 4 | Preferred Alternative |
|---|---|---|
| **River Access:** All river access areas that involve vehicle traffic would be redirected to designated roads and parking areas outside the riparian area. Vehicles would not be allowed to enter the river. Areas within the riparian area that have experienced significant degradation would be rehabilitated. Major river access points originating in campgrounds and day use areas would have designated/signed trails leading from parking areas. The lower dam area would be closed to public vehicle access. Walk-in boat launching and landing would be allowed. | **River Access:** Same as Alternative 3. | **River Access:** All river access areas that involve vehicle traffic would be re-routed to designated roads and parking areas outside the riparian area and rehabilitated. Specific areas would be designated for boat launching/landing at Big Bend, Lone Pine, and just south of the Chimney Rock area. Except for boat launching/landing, vehicles would not be allowed to enter the river. Small boating devices such as rubber inflatables would be allowed to enter the river at any point by means of walk-in access. River access areas experiencing significant degradation from foot traffic would be re-routed and rehabilitated. Other river access areas would be maintained to reduce further degradation. Major river access points originating in campgrounds and day use areas would have designated/signed trails leading from parking areas. The lower dam area would be closed to public vehicle access. |
| **West Side Access:** Same as Alternative 2. | **West Side Access:** Same as Alternative 2, except a small foot bridge would be constructed across the river at Chimney Rock campground to facilitate walk-in camping and use of a 7 mile loop trail between the dam and rocky canyon. | **West Side Access:** No vehicle access would be allowed on the west side. Direct vehicle river access areas that facilitate fording of the river would be re-routed and rehabilitated. The west side would be accessible by non-motorized traffic across the river or from the rim. No trail development would occur. |
| **Trail Access:** Major use trails on the east side of the river would be designated and maintained. Other trail networks would be re-routed and rehabilitated. Major river access points originating in campgrounds and day use areas would have designated/signed trails leading from parking areas. Chimney Rock campground would have one barrier free designated trail for river access. This trail would be surfaced with asphalt. A 4.5 mile non-motorized trail leading from Chimney Rock Campground area (Rim Trail) along the rim and down to Upper Palisades would be developed. This trail would be identified with trailhead signs and other signs to encourage appropriate use. User developed trails on the west side would remain in their primitive state and be limited to foot and horse traffic only. | **Trail Access:** Same as Alternative 3, except trails paralleling the river would not pass through designated campgrounds. All trails within the corridor would be limited to foot traffic only. The loop trail on the west side would be identified with trailhead signs and other signs to encourage appropriate use. | **Trail Access:** User developed trails on the east side of the river that show significant impact to the riparian or upland environment would be re-routed and rehabilitated. Major river access points originating in campgrounds and day use areas would be stabilized with gravel and have designated/signed trails leading from parking areas. Chimney Rock campground would have one barrier free designated trail for river access. This trail would be surfaced with asphalt. A 4.5 mile non-motorized trail leading from Chimney Rock Campground area (Rim Trail) along the rim and down to Upper Palisades would be developed. This trail would be identified with trailhead signs and other signs to encourage appropriate use. The west side user developed trails would remain in their primitive state and be limited to horse and foot traffic only. |

| Issue 4 | Alternative 1 (No Action) | Alternative 2 |
|---|---|---|
| **How should instream and riparian resources be managed?** | **Water Quantity and Quality:** Current management would remain in effect. Operation of Bowman Dam requires a year round minimum flow release of 10 cubic feet per second (cfs). Flow releases are coordinated by the manager of the Ochoco Irrigation District and ODF&W and are dependent on the availability of stored water, rainfall, temperature, and crops being grown. Flood control operation limits outflow from the reservoir so as not to exceed 3,000 cfs. Currently, the Bureau of Reclamation (BOR) protects outstanding river related resources by releasing a minimum of 75 cfs during winter months when feasible. This would continue until an alternative minimum flow is biologically determined or compelling circumstance dictates otherwise. An Instream Flow Incremental Method (IFIM) study would be conducted to biologically determine appropriate flows. No monitoring program would be used other than standard stream flow monitoring and occasional state and BOR testing of water quality.<br><br>**Fishery:** The Crooked River below Prineville Reservoir is managed by ODF&W as a basic yield "wild trout" fishery. Continue current management for resident redband rainbow trout and hatchery fingerlings that enter the river through the dam outlet works and spillway. Continue to cooperate with ODF&W and other interested groups in fish enhancement projects. Removal of woody debris would not be allowed. | **Water Quantity and Quality:** Recommend minimum flows of 30 cfs in drought years and 75 cfs in "good water" years. This flow scenario was recommended by the Bureau of Reclamation after conducting the Reservoir Space Reallocation Study in 1980. This option uses 3,700 acre-feet of flood control space within Prineville Reservoir for stream flows that protect outstandingly remarkable river related values. Ochoco Irrigation would continue to coordinate flow releases with ODF&W.<br><br>These flows have been identified to represent an alternative theme. Actual flows would be determined as a result of Prineville Reservoir storage reallocation, Deschutes Basin Investigation Report findings, IFIM study results, and other applicable flow information. Coordination would occur with DEQ to enforce water quality non-degradation policy.<br><br>**Fishery:** Same as Alternative 1, except when necessary, construct natural appearing instream structures to enhance fish habitat diversity and other river related resource values. New fish habitat structures or modifications would be allowed within the high water channel only if they enhance river related resources. |

| Alternative 3 | Alternative 4 | Preferred Alternative |
|---|---|---|
| **Water Quantity and Quality:** Same as Alternative 2, except recommend an increase in minimum flow release from Bowman Dam to 75 cfs year-round. Coordination would occur with appropriate agencies to allow occasional maximum flood releases up to 3,000 cfs during spring months to resemble natural flooding. Managed flooding would occur during "good water" years unless normal dam operation dictates otherwise.<br><br>These flows have been identified to represent an alternative theme. Actual flows would be determined as a result of Prineville Reservoir storage reallocation, Deschutes Basin Investigation Report findings, IFIM study results, and other applicable flow information. Coordination would occur with DEQ to enforce water quality non-degradation policy. | **Water Quantity and Quality:** Same as Alternative 3, except recommend minimum flows of 75 cfs from July to January, 150 cfs for February and June, and 255 cfs from March to May. This flow scenario is based on the Deschutes Basin Investigation Report.<br><br>These flows have been identified to represent an alternative theme. Actual flows would be determined as a result of Prineville Reservoir storage reallocation, Deschutes Basin Investigation Report findings, IFIM study results, and other applicable flow information. Coordination would occur with DEQ to enforce water quality non-degradation policy. | **Water Quantity and Quality:** Same as Alternative 1, except continue a minimum flow of 75 cfs during winter months, when feasible, until quantifiable flows can be determined as a result of Prineville Reservoir storage reallocation, Deschutes Basin Investigation Report findings, IFIM study results, and other applicable flow information. Coordination would occur with appropriate agencies to allow occasional maximum flood releases up to 3,000 cfs during spring months to resemble natural flooding. Managed flooding would occur during "good water" years unless normal dam operation dictates otherwise. Coordination would occur with DEQ to enforce water quality non-degradation policy. |
| **Fishery:** Same as Alternative 2, except manage the fishery to increase native fish biodiversity and productivity. Eliminate migration of hatchery fingerlings into the river by constructing a fish screen at the dam outlet works and spillway. | **Fishery:** Same as Alternative 3. | **Fishery:** The Crooked River below Prineville Reservoir is managed by ODF&W as a basic yield "wild trout" fishery. Continue current management for resident redband rainbow trout and hatchery fingerlings that enter the river through the dam outlet works and spillway. When necessary, construct natural appearing instream structures to enhance fish habitat diversity and other river related resource values. New fish habitat structures or modifications would be allowed within the high water channel only if they enhance river related resources. Continue to cooperate with ODF&W in fish enhancement projects. Removal of woody debris would not be allowed. |

| Issue 4 | Alternative 1 (No Action) | Alternative 2 |
|---|---|---|
| **How should instream and riparian resources be managed? (cont)** | **Riparian:** The riparian zone would be managed to achieve proper functioning ecological condition. Riparian enhancement projects would be coordinated with ODF&W and other interested groups and analyzed on project by project basis to rehabilitate severe riverbank erosion.<br><br>Stream bank erosion control, diversions, and other bank protection structures would be allowed if they enhance river resources, reduce existing impacts and are natural in appearance. Prescribed fire would occasionally take place to encourage native riparian vegetation growth and maintain consistency of natural aesthetics within the canyon. Prescribed juniper cutting could occur in areas where upland vegetation encroachment is adversely affecting the riparian zone. Juniper rip-rap could be placed in areas where severe cut-bank erosion is occurring. Spot grazing and mechanical vegetation manipulation methods may be used to control noxious weeds. | **Riparian:** Same as Alternative 1, except natural appearing methods of bank stabilization such as planting native riparian vegetation, placement of downed natural woody debris, and introduction of beavers would be encouraged. Introduction of non-native plant species would be allowed if found to enhance river related values. |

| Alternative 3 | Alternative 4 | Preferred Alternative |
|---|---|---|
| **Riparian:** Same as Alternative 2, except natural appearing methods of bank stabilization would be required under most circumstances. Mechanical means of vegetation management would be encouraged (i.e. hand grubbing of noxious weeds). Plant only native riparian vegetation species as needed to encourage a natural ecological condition. | **Riparian:** Same as Alternative 3, except natural appearing methods of bank stabilization would always be required.<br><br>This would include projects such as placement to change hydraulic action in the river, placement of on site downed material to encourage soil deposition, and other projects that do not use man-made materials. | **Riparian:** Same as Alternative 1, except natural appearing methods of bank stabilization would be required under most circumstances. Mechanical means of vegetation management would be encouraged (i.e. hand grubbing of noxious weeds). Introduction of non-native plant species would be allowed if found to enhance riparian related values. |

| Issue 5 | Alternative 1 (No Action) | Alternative 2 |
|---|---|---|
| **How should upland resources be managed?** | **Wildlife and Vegetation:** Maintain vegetative diversity with a mix of seral conditions to promote biodiversity while focusing on ecological conditions between mid and late seral status. Only naturally appearing enhancement projects would be allowed. Prescribed fire would be used to allow the upland slopes to return to a natural fire-dependent watershed ecosystem. Fires which would not threaten or damage adjacent private lands or the primary values of the corridor would be allowed to burn, thereby enhancing the natural ecosystem. Wildfire suppression would occur at whatever level necessary to protect public facilities with minimal mechanical disturbance. Mosaic juniper thinning could occur in areas experiencing vegetative health problems and in areas not visible from the canyon floor. State laws governing use of chemicals to resolve noxious weed problems would remain in effect.<br><br>Continue maintaining habitats for federal and state listed threatened, endangered, and sensitive plant and animal species. | **Wildlife and Vegetation:** Same as Alternative 1, except utilize a combination of mechanical vegetation control strategies while focusing on prescribed fire and juniper thinning to provide maximum wildlife habitat diversity, a healthy ecosystem, and protection of scenic values. Wildlife enhancement projects such as installation of nest boxes and platforms for birds would take place to enhance river related values.<br><br>Federal and State agencies would conduct more detailed inventories for protection of federal and state listed threatened, endangered, and sensitive plant and animal species. Introduction of non-native plant and animal species would be allowed if found to enhance species richness and ecological condition while not adversely affecting outstandingly remarkable values. |

| Alternative 3 | Alternative 4 | Preferred Alternative |
|---|---|---|
| **Wildlife and Vegetation:** Same as Alternative 2, except prescribed fire and mechanical vegetation control strategies other than juniper thinning would be used to provide for maximum wildlife habitat diversity and a natural fire-dependent ecosystem while protecting scenic values. Juniper thinning would not be allowed. Allow chemical management within the corridor only when no other vegetation management tools are effective.<br><br>Non-native plant and animal species would not be introduced into the corridor. | **Wildlife and Vegetation:** Same as Alternative 3, except chemical management would not be used to protect and/or enhance wildlife habitat. Allowable upland enhancement projects would be suppressed until regrowth of juniper occurs. | **Wildlife and Vegetation:** Maintain vegetative diversity with a mix of seral conditions to promote biodiversity while focusing on ecological conditions between mid and late seral status. Management would utilize a combination of mechanical vegetation control strategies while focusing on prescribed fire and juniper thinning to provide maximum wildlife habitat diversity, a healthy ecosystem, and protection of scenic values. Only naturally appearing enhancement projects would be allowed. Mosaic juniper thinning could occur in areas experiencing vegetative health problems and in areas not visible from the canyon floor. Wildlife enhancement projects such as installation of nest boxes and platforms for birds would take place to enhance river related values. Prescribed fire would be used to allow the upland slopes to return to a natural fire-dependent watershed ecosystem. Fires which would not threaten or damage adjacent private lands or the primary values of the corridor would be allowed to burn, thereby enhancing the natural ecosystem. Wildfire suppression would occur at whatever level necessary to protect public facilities with minimal mechanical disturbance. Allow chemical management within the corridor only when no other vegetation management tools are effective.<br><br>Federal and State agencies would conduct more detailed inventories for protection of federal and state listed threatened, endangered, and sensitive plant and animal species. Introduction of non-native plant and animal species would be allowed if found to enhance species richness and ecological condition while not adversely affecting outstandingly remarkable values. |

| Issue 6 | Alternative 1 (No Action) | Alternative 2 |
|---|---|---|
| **How should public information and education be managed?** | **Information and Education:** Current information and education efforts would continue. General rules and regulation brochures would be handed out on-site by maintenance personnel, seasonal recreation technicians, and campground hosts. A Back Country Byway kiosk would be installed within the corridor. Other information dispersal efforts include bulletin boards, site and facility signs, and distribution of information and regulation pamphlets through local vendors and managing agencies. | **Information and Education:** Same as Alternative 1, except develop brochures and pamphlets that address specific resource protection and education. Bulletin boards would be installed in campgrounds and day use areas where they do not already exist. Install an interpretive display at the Chimney Rock Campground. Campground hosts would be trained to provide better visitor services. |

| Alternative 3 | Alternative 4 | Preferred Alternative |
|---|---|---|
| **Information and Education:** Same as Alternative 1, except develop brochures and pamphlets that address specific resource protection and education and interpret special resources within the canyon. High profile bulletin boards would be installed at developed campgrounds and day use areas. Interpretive displays would be installed at Chimney Rock, Big Bend, Upper Lone Pine, Upper Palisades, and at the Rim Trail Trailhead. An interpretive walk brochure would be developed for the Rim Trail. | **Information and Education:** Professionally produced media devices would be distributed throughout the corridor, to the local chamber of commerce and state wide private and public entities. A more extensive campground host program would be provided. Environmental interpretation programs would be offered in larger campgrounds. An extensive information and interpretation signing effort would occur throughout the entire corridor. Points of interest would be identified and interpreted. A semi-annual flyer would be distributed to promote better public communication after the plan is implemented. | **Information and Education:** Brochures and pamphlets would be developed that address specific resource protection and education and interpret special resources within the canyon. Bulletin boards would be installed at developed campgrounds and day use areas. Interpretive displays would be installed at Chimney Rock, Big Bend, Upper Palisades, and at the Rim Trail Trailhead. A Back Country Byway kiosk would be installed within the corridor. An interpretive walk brochure would be developed for the Rim Trail. Campground hosts, recreation technicians, and maintenance personnel would be trained to provide professional visitor contact. Other information dispersal efforts include site and facility signs, and distribution of information and regulation pamphlets through local vendors and managing agencies. |

## F. Management Actions Common to All Alternatives

Some management actions have already been taken, or are in the process of being implemented by one or more of the managing agencies as a result of previous planning decisions or interagency agreements. Other actions believed to lack public controversy or which do not significantly impact the environment are described as "Management Actions Common to All Alternatives". They are considered decisions that will be carried forward under all alternatives. They include the following:

### Recreation Opportunities

Existing roaded natural experiences would be maintained between the east side of the river and the east edge of Highway 27. Existing semi-primitive non-motorized experiences would be maintained on the west side of the river and east of Highway 27. Management actions within the alternative range would not go beyond the criteria necessary to retain these experiences.

Managing agencies would continue to coordinate enforcement of regulations and administrative rules.

Managing agencies would conduct visitor use, angler preference, and statistical creel surveys to analyze current fishing regulations. Hunting and trapping regulations would continue to be evaluated by the ODF&W for appropriate regulations.

BLM would be lead agency managing commercial and competitive recreation use within the corridor. All special use permits would be analyzed for their consistency with wild and scenic river management objectives.

Low impact animals such as llamas would be allowed in the same areas that people use unless it was determined that the activity created adverse impacts to outstandingly remarkable values.

Monitor and identify high impact recreation opportunities and create special use limits, use areas, and/or restrictions for them. Recreation opportunities would be limited to specific geographic areas or excluded if resource monitoring determined that recreation use had a significant, adverse impact on outstandingly remarkable values.

### Camping and Day Use

The managing agencies would develop a cooperative system for gathering and analyzing camping and day use data to maintain accurate monitoring information to ensure that management objectives are met.

Facility development would remain within criteria standards for roaded natural on the east side between the river and the highway, and semi-primitive non-motorized on the west side of the river corridor. Construction and management of facilities would require compatibility with corridor landscape characteristics.

All new development would consider barrier free access as law requires. Special use facilities for any disability would be installed as determined necessary.

Operations and maintenance of campground facilities would continue at whatever level necessary to meet BLM standards consistent with level of use, development, and maintenance standards.

Visitor use surveys would conducted to monitor user values and needs.

Limits of acceptable change criteria would be utilized to evaluate necessary management actions for overnight campsites and day use

areas. Degraded campsites and day use areas needing rehabilitation would be closed until vegetative recovery has occurred. Once rehabilitation is complete, camping or day use may be allowed if the sites are capable of sustaining use and that use is consistent with management objectives.

**Public and Administrative Access**

The BLM would increase emphasis on implementation and enforcement of decisions in the Brothers/LaPine Resource Management Plan regarding motorized vehicle access within the corridor.

Motorized vehicles would be limited to designated roads, parking and camping areas. Routes not designated would be closed and rehabilitated.

Access along State Scenic Highway 27 would be managed by Oregon State Department of Transportation. Speed limits and parking along the highway are subject to state traffic laws.

The quarry area would remain as a source of fill material for campground stabilization and small operation highway maintenance as long as scenic values are not adversely impacted.

**Instream and Riparian Resources**

The Lower Crooked Wild and Scenic River would be preserved in its existing free-flowing condition without impoundment, diversion, channelization, rip-rapping, or other modifications of the river that adversely affect the outstandingly remarkable values for which the river was designated.

The managing agencies in cooperation with ODF&W would develop a consistent and well coordinated inventory, management plan implementation, funding and monitoring program for instream and riparian resources along the river corridor to ensure that management objectives are met.

The BOR would continue operations and maintenance of Bowman Dam to ensure non-impairment of outstandingly remarkable values within the river corridor.

An instream flow study would be conducted to biologically determine appropriate flows released from Prineville Reservoir.

The managing agencies would cooperate with ODF&W and other interested groups to develop a long-term restoration strategy to restore anadromous fish.

Fishery enhancement projects would be encouraged. Removal of woody debris would not be allowed.

Managing agencies would encourage activities that allow the riparian zone to remain in proper functioning ecological condition.

Use of chemicals in riparian areas for noxious weed control would be prohibited.

Livestock grazing within the riparian area would be discontinued, with short-term spot grazing allowable if determined necessary. Management would occur as discussed in the Upland Resources section below.

**Upland Resources**

The managing agencies would maintain vegetative diversity with a mix of seral conditions to promote biodiversity while focusing on ecological conditions between mid and late seral status. Vegetation manipulation mosaics would fully consider landscape characteristics to retain scenic quality.

Prescribed fire would be used to allow the upland slopes to return to a natural fire-depen-

dent watershed ecosystem. Fires which do not threaten or damage adjacent private lands or the primary values of the corridor would be allowed to burn, thereby enhancing the natural ecosystem. Wildfire suppression would occur at whatever level necessary to protect public facilities with minimum mechanical disturbance.

The cutting or burning of any dead or down vegetation for campfire use within the corridor would not be allowed. This does not include the potential for permits for harvest of personal use firewood or commercial permits related to prescribed burning or mosaic juniper thinning carried out to achieve vegetation management objectives.

Coordination would occur with appropriate agencies and private individuals to ensure the watershed remains in proper functioning condition.

The managing agencies in cooperation with ODF&W would conduct inventories for protection of federal and state listed threatened, endangered, and sensitive plant and animal species. Continue monitoring habitats for federal, state listed T & E plant and animal species. Facilitate for species richness and diversity.

New road construction would not be allowed on the west side of the river or east of Highway 27. Adjacent landowners would be encouraged to consider scenic values in their land use and property management activities.

Livestock grazing within the River Pasture of the Prineville Dam Allotment (No. 5137) would be discontinued, unless it was determined that no other vegetation management strategy was appropriate. If livestock grazing did occur, it would take place in small enclosures for short periods, primarily between late winter and early spring before significant visitor use begins. Fencing would be installed in areas where natural boundaries don't exist. Those livestock grazing allotments upon the plateau areas above the rims that finger into the wild and scenic river boundary would be managed as defined under the Brothers/LaPine Resource Management Plan. Refer to Appendix G for livestock grazing allotment boundaries.

**Cultural Resources**

The managing agencies would manage archaeological/historical and traditional use resources within the Lower Crooked River canyon through a coordinated plan of goals and objectives common to the BLM and BOR. Private landowners would be encouraged to participate in this process.

The managing agencies would each maintain a cultural resources database atlas for lands under their jurisdiction. The Tribes would contribute information on significant traditional use sites and materials.

The managing agencies would conduct an appropriate level of inventory, over lands under their jurisdiction, to identify prehistoric and historic sites or features in areas proposed for surface-disturbing projects. Sites discovered would be evaluated for significance following National Register of Historic Places criteria, in consultation with the State Historic Preservation Office. The managing agencies would consider the effect of any proposed undertaking on sites which meet the National Register criteria by following regulations of the Advisory Council on Historic Preservation or a memoranda of agreement negotiated with the Council.

Projects with ground-disturbing activities that would affect National Register eligible sites would be relocated. Project cancellation or mitigating measures would take place in areas where relocating a planned project is not

feasible. Mitigation would usually be an attempt to extract and preserve those attributes of a site which qualify it for the National Register.

The managing agencies would consult with, and invite the participation of, the Tribes in the early planning stages of proposed surface disturbing activities.

The managing agencies would protect and/or stabilize cultural resource sites from human-caused or natural sources of erosion or deterioration where possible.

The managing agencies would increase emphasis on enforcement of established laws, regulations, and policies related to the protection and preservation of cultural resource values. A monitoring plan would be developed and implemented to document changes (natural and human-caused) and ensure adequate protection.

The managing agencies would develop and implement a public information/education program aimed at increasing public awareness of and appreciation for the significance of cultural resources.

**Information and Education**

The managing agencies would become actively involved in seeking volunteers to assist in public information and education programs, encourage stewardship, and to provide annual care for the area. The managing agencies would also coordinate efforts with local/regional conservation groups to conduct year round protection of the river related resources.

BLM would begin its Back Country Byway program by seeking a partnership with the local Chamber of Commerce, State Department of Transportation, BOR, and other interested parties facilitate vehicle touring within the corridor. A memorandum of understanding would be formulated to ensure cooperation among these agencies. The partnership group would determine the level of advertisement to the public. Except for the Back Country Byway Program, tourism efforts would remain limited between the BLM and other local, state and federal agencies. The BLM would also actively seek coordination with the Local Chamber of Commerce to select other devices to promote tourism.

Camping and day use regulations and administrative actions would be posted and changed as needed to meet management objectives.

The managing agencies would develop a strategy to incorporate "Tread Lightly", "Pack It In - Pack It Out", and "Leave No Trace" ethics into the public information and education program.

Brochures, signs and interpretive materials would contain information on rules and regulations, access roads, trails, parking, and camping.

**Law Enforcement and Emergency Services**

Law enforcement efforts would continue with better communications between agencies. Annual meetings would be conducted to facilitate better coordination. A uniform communication network would be implemented. Enforcement patrols would be conducted as defined by the coordination team.

Access along State Scenic Highway 27 would be managed by Oregon State Department of Transportation. Speed limits and parking along the Highway would remain subject to state traffic laws.

The BLM would continue fire suppression responsibilities and implement decisions in the Brothers/Lapine Resource Management Plan regarding the prevention and suppression of

wildfire to protect public values and adjacent private property.

Public land safety regulations would be developed along with an active signing campaign within high use areas.

The managing agencies would improve response to potential natural and human-caused emergencies by providing "Radio Help" during high visitor use periods.

The managing agencies would develop a coordinated public information and education program which explains fire regulations, individual liability, and fire hazard within the river corridor.

**Utility and Transportation Corridors**

Other than State Highway 27 and a transmission line located on BOR lands just east of Bowman Dam (OR 5799) there are no rights-of-way in the river corridor. Additional rights-of-way would be required to be underground and be located in suitable areas adjacent to State Highway 27.

**Mineral Leases and Land Tenure**

Public lands within the corridor would be retained in public ownership.

The managing agencies would require that a plan of operation be filed prior to any surface-disturbing activity. The plan would specify the actions necessary to protect and/or enhance outstandingly remarkable values within the corridor. This applies to saleable, leasable, and locatable minerals and materials.

**Wild and Scenic River Boundary**

In October 1988, this segment of river was designated by Congress as a National Wild and Scenic River. A preliminary boundary was later developed with public input to include and protect or enhance the outstandingly remarkable values that caused the river to be designated. Alterative boundaries were discussed, but were dismissed as a result of being outside the scope of the plan. It has been determined that the preliminary boundary would be used to define the planning area as shown on the Existing Situation Map.

The withdrawn zone below Bowman Dam, also shown on the Existing Situation Map, would remain open to future Dam maintenance or reconstruction needs. Activities inside the boundary, within the withdrawn zone, would be evaluated on a case-by-case basis to ensure compliance to Wild and Scenic River Values. Any potential impacts associated with the Safety of Dams Project would be analyzed in an environmental assessment prepared by BOR.

Sign boundary in heavy conflict areas to reduce trespass onto adjacent private lands. The managing agencies would coordinate with private landowners to ensure proper signing and to resolve other conflicts as needed.

# *III. Affected Environment*

This chapter describes the existing physical, biological, social and economic environment that may be affected by management activities proposed in the wild and scenic river corridors. The outstandingly remarkable and significant river values for which the river was added to the national system are also described. This information forms the baseline for measuring changes and comparing alternatives. A more detailed narrative of all river values is contained in the Lower Crooked River Resource Assessment. This document is available upon request at the Bureau of Land Management, Prineville District Office.

**River Description**

The Federally designated 8-mile Chimney Rock segment of the Lower Crooked River is located 12 miles south of Prineville, Oregon. The river corridor was included in the National Wild and Scenic River System as a result of its Outstandingly Remarkable scenic and recreation resource values. The river meanders through a very scenic, rugged canyon that includes towering basalt cliffs up to 600 feet high, with scattered western juniper growing on its steep hillsides. State Scenic Highway 27, adjacent to the river on the east bank, is also a National Back Country Byway. Several primitive BLM camping areas and the Chimney Rock Recreation Site are also located on the east bank between the highway and the river. Outstanding fishing opportunities exist for catching rainbow trout, mountain whitefish, and an occasional smallmouth bass.

This segment is also protected as an Area of Critical Environmental Concern (ACEC) as described in the Brothers/LaPine Resource Management Plan. The area has specific management use guidelines focusing on wild and scenic interim management goals and objectives.

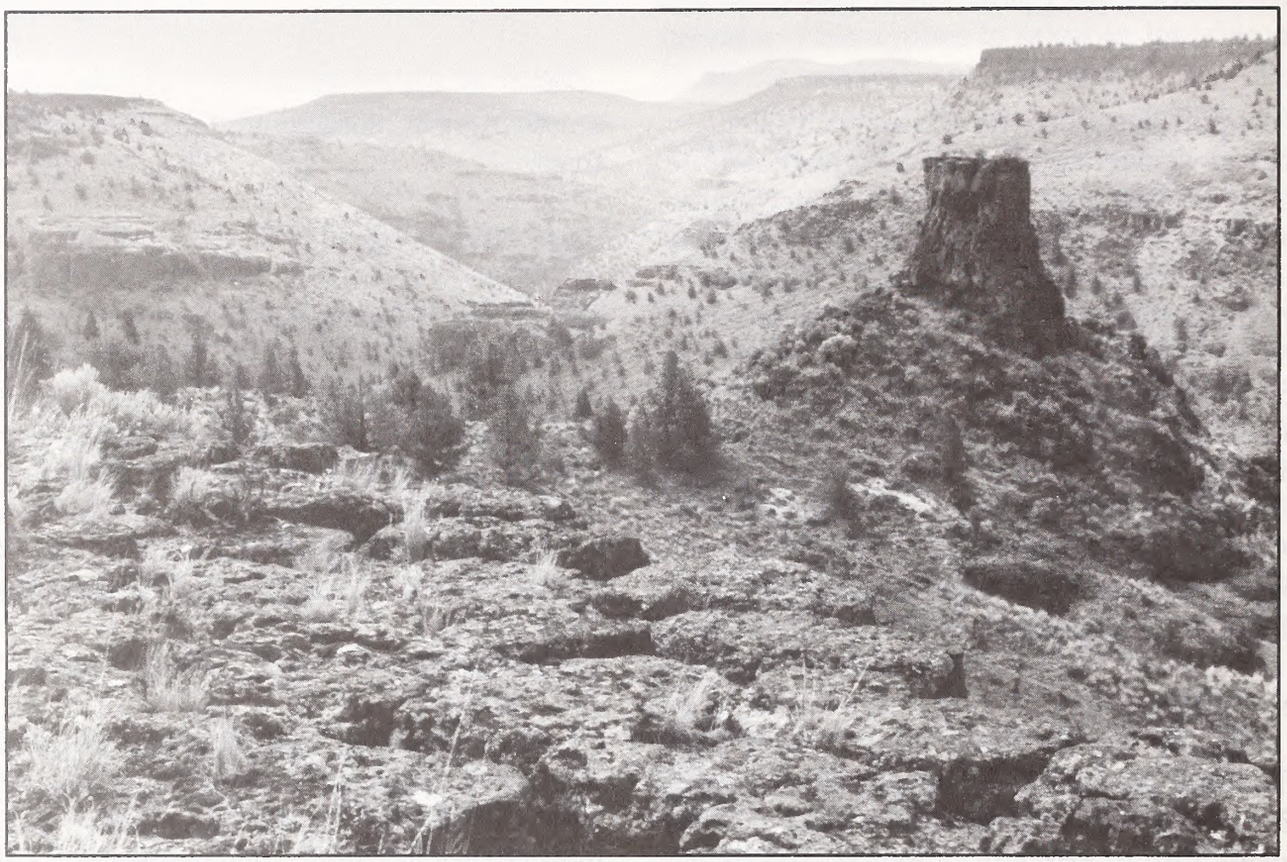
**Land Ownership**

The Lower Crooked River corridor encompasses 2,560 acres of public land along the river from Bowman Dam to State Scenic Highway 27 mile marker 12. The Bureau of Reclamation (BOR) manages one river mile (320 acres), while the Bureau of Land Management (BLM) manages seven river miles (2,220 acres). Only 40 acres of private land exist within the boundary.

**Scenic Values**

Scenic quality is an Outstandingly Remarkable value within this river corridor. A Visual Resource Management (VRM) study conducted in the summer of 1991 also determined that scenic resources within the Lower Crooked River corridor are of high quality and are highly sensitive. The landscape character between the river and the highway fit into VRM management class III which would allow for some physical changes only if they remain subordinate to the existing landscape character. The landscape character of the remaining lands within the corridor fit into VRM management class II which requires that management activity not be evident and that changes repeat the basic elements of form, line, color, and texture found in the predominant natural features existing within the landscape. This information will be used to monitor impacts to scenic resources over time. Refer to Appendix E for more detailed information on the VRM study.

The scenic value of the Lower Crooked River is primarily within the foreground landscape as viewed from the river, trails, roads and other viewpoints within the corridor. The area con-



*One of many scenic vistas within the river corridor*

tains a diversity of landforms and vegetation that capture the attention of the viewer and contribute to a positive visitor experience. The elements of the foreground that make the Lower Crooked River unique include: the massive walls and escarpments of deeply eroded rust-brown basalt that tower above the meandering blue-green Lower Crooked River, the lush green riparian vegetation that changes color with each season, the western juniper scattered on the steep hillsides and the excitement of observing eagles, osprey and other wildlife.

State Scenic Highway 27, provides views of the spectacular geologic formations and eroded lava flows throughout the narrow, winding canyon corridor. It has received awards from the Federal Highway Administration for its natural appearing construction and its compatibility with the surrounding environment. The Lower Crooked River, adjacent to the highway, led to the recent designation of the route as a National Back Country Byway.

The setting from which the viewer experiences the scenery is perhaps the greatest quality of this river. River users have a semi-primitive experience within a largely untouched scenic viewshed within the corridor. Although most intrusions blend in with the natural character of the area some do not. The highway and the users upon it presents the largest intrusion to scenery within the canyon. Another significant scenic intrusion within the viewshed of the corridor, but outside of the wild and scenic river boundary, is Bowman Dam. It is located directly adjacent to the upstream end of the

corridor boundary and diminishes only a small portion of scenic quality within the corridor. Cattle and their visual effects have been present in the past. However, cattle grazing has not occurred in twelve years. BLM facility development along the Lower Crooked River is limited to isolated pit toilets, picnic tables, fire pits and BLM maintained roads. Due to the dense stands of juniper trees and disbursement of campground areas, these improvements do not dominate the landscape.

### Recreation Opportunities and Public Access

Recreation is an Outstandingly Remarkable value within this river corridor. A diversity of year round Roaded Natural and Semi-Primitive Non-Motorized recreation opportunities are available throughout the river corridor (refer to Text Box 1). These include but are not limited to fishing, hiking, swimming, biking, camping, picnicking, hunting, trapping, photography, wildlife observation, boating, and vehicle touring.

### Text Box 1 - Recreation Opportunity Spectrum

The Bureau of Land Management and other agencies use the Recreation Opportunity Spectrum (ROS) framework to characterize outdoor recreation settings (places people go for recreation) based on such characteristics as access, naturalness, likelihood of encounters with other visitors, level and type of facilities and management regulations, and evidence of past recreational use. The ROS contains a range of opportunity classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban. The following are descriptions of the classes referred to in the text.

**Semi-Primitive Non-Motorized** - characterized by a predominantly natural or natural appearing environment of moderate-to-large size. Interaction between users is low, but there is often evidence of other users. Minimum on-site controls and restrictions are present, but subtle. Motorized use is not permitted. High probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility and self-reliance through the application of outdoor skills in and environment that offers challenge and risk.

**Roaded Natural** - characterized by predominately natural-appearing environment with moderate evidence of the sights and sounds of people. Such evidence usually harmonizes with the natural environment. Interaction between users many be low to moderate with evidence of other users prevalent. Resource modification utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities. There exists about equal probability to experience affiliation with other user groups and for isolation from sights and sound of humans. There also is an opportunity to have a high degree of interaction with the natural environment. Challenge and risk opportunities associated with more primitive types of recreation are not very important. Practice and testing of outdoor skills might be important. Opportunities for both motorized and non-motorized forms of recreation are possible.

#### Applying the Recreation Opportunity Spectrum

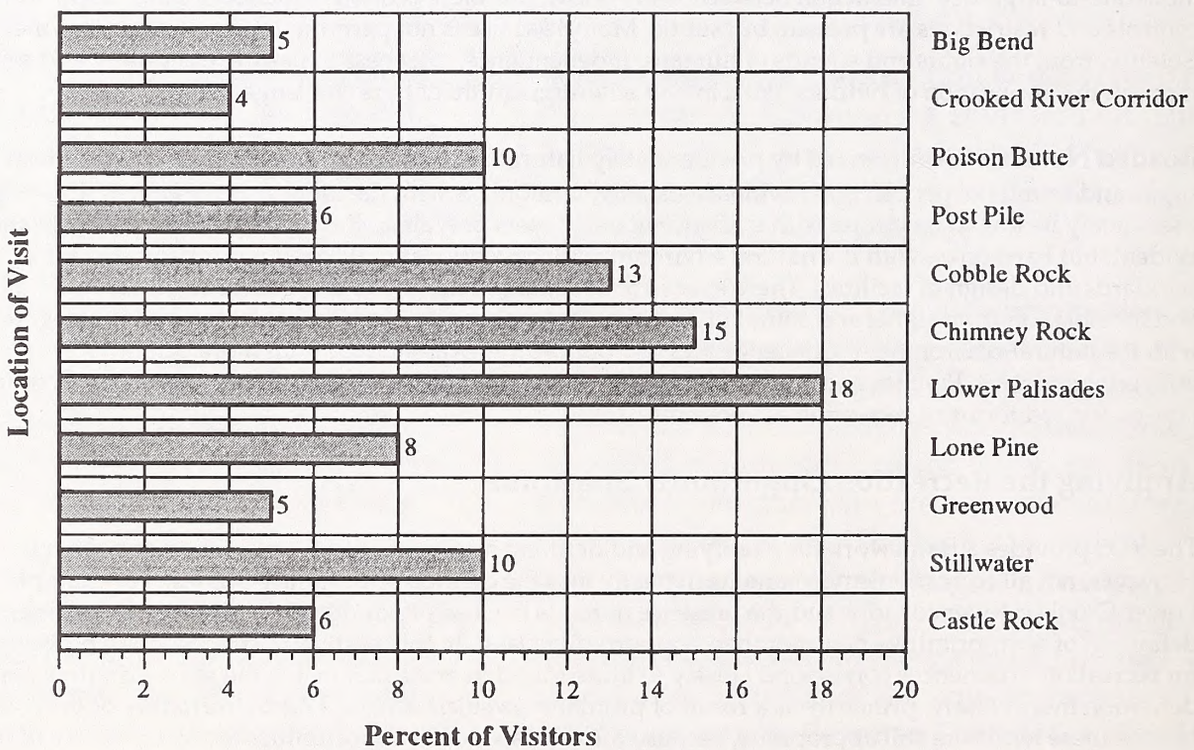
The ROS provides a framework for stratifying and defining classes of outdoor recreation opportunity environments. However, not all recreation environments fit neatly into the defined opportunity classes. For example, the size of the Lower Crooked River corridor and the presence of roads in close proximity to the river are inconsistent with the definition of semi-primitive non-motorized opportunity class. In this particular environment, however, opportunities for recreation experiences correspond closely to those found in areas that match the semi-primitive non-motorized definition more closely, primarily as a result of prohibitive vehicle access. Due to the nature of the river corridor, we believe these terms are still appropriate, because the corresponding opportunities for certain types of recreation experiences are available.

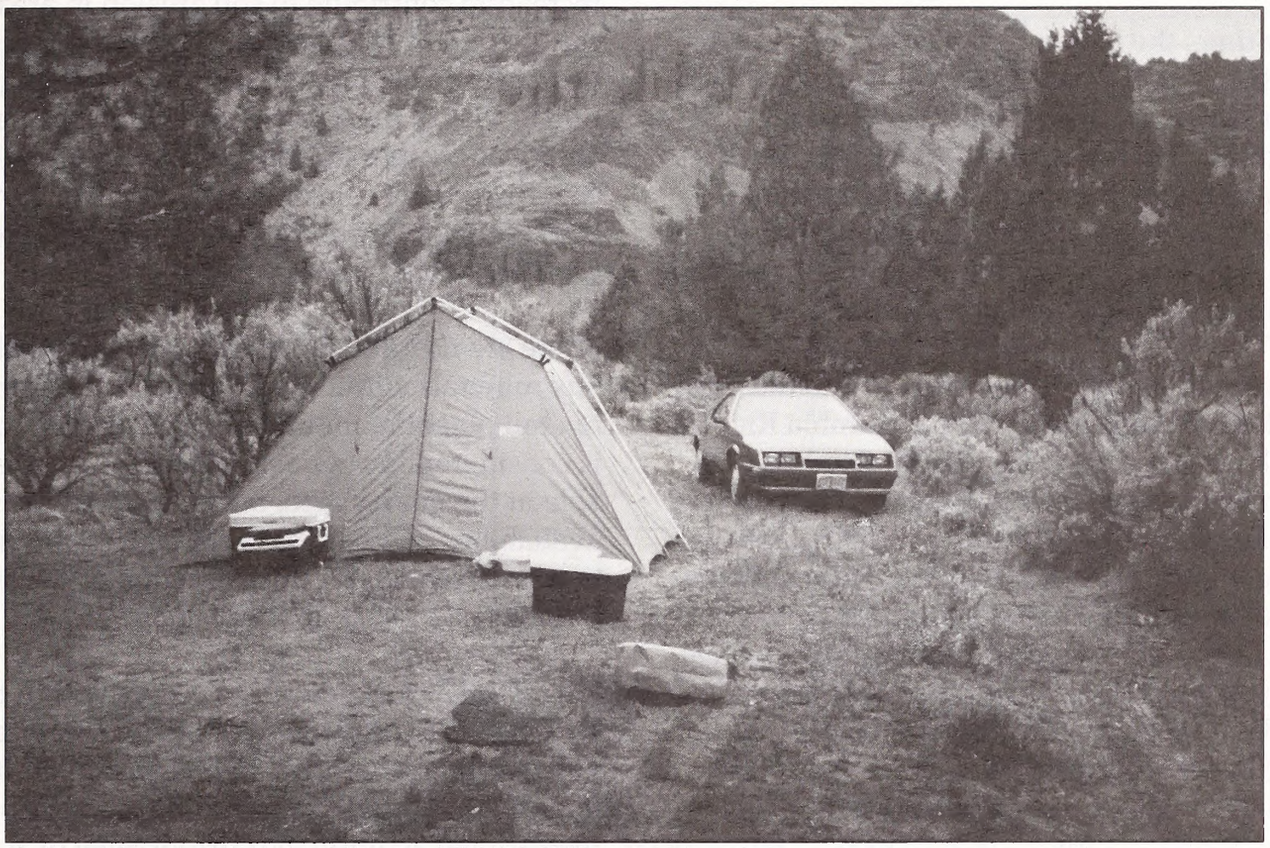
A recent BLM survey indicates that the river receives approximately 30,000 visits annually from geographically diverse origins. Visitors that frequent the area reside in Oregon and other western region states. It has been determined that 48% of the visitors originate from the Portland Metropolitan Area, 17% from the local area, 14% from other Central Oregon communities, 9% from the Willamette Valley, 6% from other areas within Oregon, and 5% from out of state. International visitors are rare but have been present in the past. Refer to Appendix D for more detailed survey information.

The major elements of recreation use are: fishing, camping, picnicking, wildlife observation and vehicle touring. Recreational fishing is by far the highest engaged in activity on the river. Excellent opportunities exist for catching rainbow trout, mountain whitefish, and an occasional smallmouth bass. The Lower Crooked River is one of few rivers in Oregon that remains open to fishing year round. During regular trout season, the river has a 5 trout bag limit with no particular restrictions on gear type. The time period between October 31 and the trout opener in April has become very popular for off season, catch and release, flyfishing. Six commercial guides are permitted to provide professional services within this river corridor, but rarely do. This is primarily due to the limited ability to navigate the river.

One developed and nine semi-developed campgrounds, as well as several day use areas located along the river are easily accessible off of State Scenic Highway 27. Visitors are required to remain on existing roads within and adjacent to these areas but often do not. Heavy degradation on these existing roads and undesignated areas, particularly in riparian areas, has

**Table 4 - Location of Visit to The Area**





*Car camping is one of many popular recreation activities within the river corridor*

occurred as a result of uncontrolled vehicle access. In addition, visitors often pull off the highway in one of many parking and pullout areas where the gravel shoulder is wide enough, and walk down the bank to the river's edge. These and other river access areas are experiencing extensive trail networking resulting in adverse impacts to riparian resources. Campgrounds within the river corridor are the primary destination for many campers. Each campground offers a unique experience. As shown in Table 4, visitors prefer to spread out for isolation and solitude. These areas are also very popular for those visiting the western end of Prineville Reservoir. The local and regional popularity of these camping areas and the river itself draws numerous fishermen, picnickers, and other day users during spring and summer months. These attractions and others are widely publicized through State Scenic Highway and National Back Country Byway publications.

The close proximity of the river to the City of Prineville, Prineville Reservoir, and adjacent public lands well as the increasing number of tourists that frequent the area will likely bring increased pressure on the resource values for recreation purposes. A campground inventory was conducted during the winter of 1991-92 to identify facilities, use sites, and the level of impact they experience. This and occasional visitor use studies are used as monitoring tools to resolve future resource damage and visitor use conflicts. Refer to Appendix F for related campground inventory information.

### Geology, Mineral and Soils

Over time, the Lower Crooked River has dissected a massive basalt plateau, exposing cliffs, sheer basalt walls up to 600' high, having irregular patterns of rust-dark brown basalt. It features interesting devil's postpiles, talus slopes, rim rocks, and narrow tributary canyons. The width of this canyon rim ranges from 1/2 mile to over 1 mile in width.

The canyon is deeply entrenched into the most southerly basalt flows of the Columbia River Basalt Group. These continental flood basalts are very extensive in north central Oregon, and erupted probably 16.5 to 14.5 million years ago in the middle and late Miocene. This canyon is a smaller example of the Lower Deschutes and John Day River canyons. Although this area is not unique geologically, it is an excellent example of how river erosion of a volcanic basalt plateau occurs. This river segment has excellent geologic qualities for this reason.

Soils in the Lower Crooked River corridor vary with the local topography and characteristics of the substrate. The corridor is dominated by fluvial deposits adjacent to the river and steep bedrock and talus slopes (the canyon walls) leading up to the higher plateau areas. Soils developed on the fluvial deposits are primarily river wash developed on low river terraces and islands, mainly next to the river or within the channel. The parent is mixed river sediment, ranging from silt to extremely cobbly sand with deep well drained soils with moderate permeability. In low areas of the floodplain, there is potential for significant erosion and deposition as a result of flooding. The steeper slopes are primarily comprised of stony cobbly loam, weathered from basalt, andesite and ash where soil permeability is moderate and runoff is rapid. These soils are unstable and susceptible to erosion in both natural and disturbed states.

Motor vehicle activity and heavy dispersed recreation contribute to soil erosion in areas confined to physical access. When these activities cause soil compaction and a direct degradation or loss of plant cover and vigor, the permeability and water holding capability of the soil diminishes, the velocity and volume of runoff is increased, and the extent and magnitude of soil erosion is accelerated.

There are no known merchantable quantities of any minerals within the river corridor. The overall potential for any mineral development is considered low. Gravel resources are available in the quarry area, but access and the availability of other gravel resources closer to market areas render the extraction of gravel unlikely.

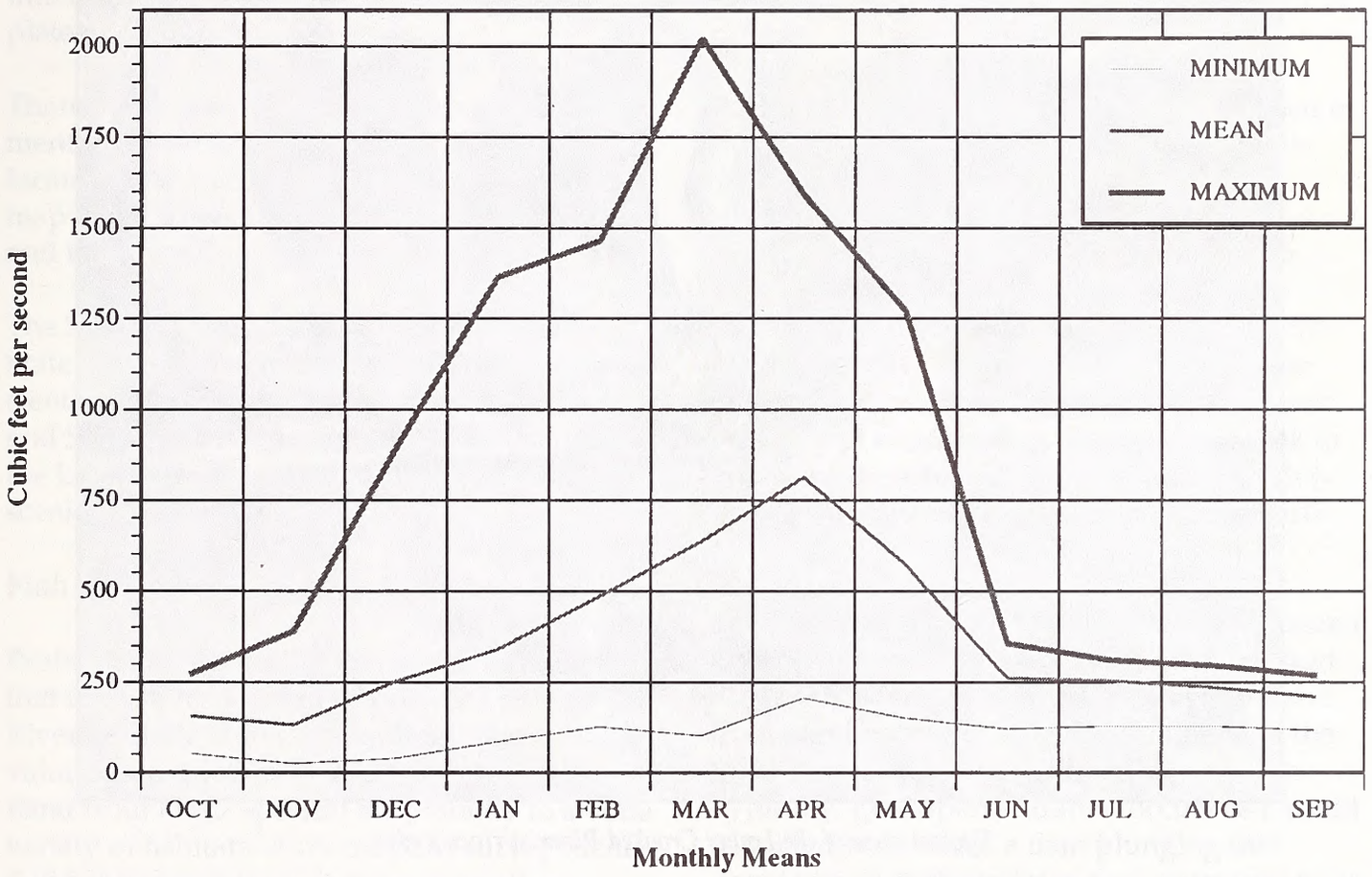
Recreational rockhounding occurs within the river corridor near the river below rocky canyon. Agate moss occurs in this area in limited quantities. Although rockhounding is a popular recreational activity, the current level of activity is considered to low.

### Hydrology, Water Quality, and Water Quantity

The Crooked River is divided into three major sub-basins - the upper, lower and South Fork Crooked River. The upper is from rivermile 72.5 to its headwaters and tributaries in the Ochoco National Forest (Ochoco and Maury Mountains). The South Fork Crooked River is further upstream and is a significant contributor to summer flows from springs sources on the G.I. Ranch.

Bowman Dam (Rivermile 72.5) and Prineville Reservoir separates the Lower from the Upper Crooked River basins. The Lower Crooked River within the wild and scenic river corridor (rivermile 72.5 through 64.5) is completely regulated by Bowman Dam which is operated by Ochoco Irrigation District under the terms of

**Figure 1 - Flow Releases 1962–1990**




a repayment contract with BOR. There are no perennial streams as tributaries in this portion of river. The mean annual flow prior to construction of the dam was 387 cubic feet per second (cfs) and after dam construction (1960) was 325 cfs. As shown in Figure 1, the average annual river flow of the Lower Crooked River below Bowman Dam for the past five years is 518 cfs. The highest maximum flow since 1984 was 3,240 and the minimum was 10 cfs, due to winter reservoir filling and dam spillway maintenance.

BOR has established an interim minimum streamflow objective of 75 cfs during non-irrigation season (November-March) below Bowman Dam. In 1990-1991, an extreme drought year, winter streamflows were held to a minimum of 30 cfs. In a non-drought year, a minimum of 75 cfs would be provided. Water releases during the irrigation season average about 320 cfs.

The water quality and quantity of the released waters from Bowman Dam and flowing immediately through the wild and scenic segment and the Crooked River Canyon are regionally a mecca for recreation and fishery use. The released water temperatures are generally constant between 47-49 degrees. The water released during the summer months for downstream irrigation provides a significant increase in summer flows and cooler temperatures for fishery values.

This segment of the Crooked River is plagued with turbidity and clarity problems resulting

*Typical view of the Lower Crooked River at river's edge*

from released waters. Water clarity for the river has been determined to be 1-2 feet. The erodible clay mineralogy of the upper and adjacent watershed soils of Prineville Reservoir and the devastating floods of 1964, along with the uncontrolled recreational use, inappropriate land use in the watershed upstream from the reservoir, wave action and irrigation draw-down along the shoreline of the reservoir have all contributed to the turbidity problem. This release of water is taken near the bottom of the reservoir and thus releases water that doesn't have the opportunity to have the sediment settle out of suspension. Because flow releases are turbid most of the year, it is believed that these conditions reduce light penetration to an extent which limits photosynthetic activity and plant (algal) growth. Within the river corridor itself, only moderate bank instability and surface erosion problems contribute to turbidity.

The BOR is in the process of completing the environmental compliance documents required for the "Safety of Dams" modification proposed at Bowman Dam which is located adjacent to the corridor boundary. "Safety of Dams" reconstruction is currently scheduled to begin in 1993 and be completed in 1995. This project would likely resolve nitrogen supersaturation problems that adversely effect aquatic life.

The only known significant water created feature that exists within the river corridor is the canyon itself. The force of the river has carved through a massive basalt plateau, exposing cliffs and sheer basalt walls up to 600' high. Although this area is not unique hydro-

logically, it offers visitors a powerful insight into how river erosion of a volcanic basalt plateau occurs.

There are no known water resource developments within the river corridor. Hoffman Dam, located on U.S.G.S 15 minute series topographic map (1962, Powell Buttes, OR) between Sterns and Bowman Dams, no longer exists.

The State of Oregon through the Division of State Lands has determined that there is sufficient evidence to support a claim of navigability and State ownership for the beds and banks of the Lower Crooked River within this wild and scenic river segment.

## Fish

Professional fish biologists have determined that the fish resource in the Lower Crooked River corridor is an Outstandingly Remarkable value based on its genetic diversity and Red Band trout (T&E Species) adaptability to a wide variety of habitats. A recent BLM survey identified fishing as the number one recreation activity within the river corridor. Stories and pictures of huge catches are found in historical records of the early 1900's. Excellent "blue ribbon" fishing opportunities still exist. Although more popular for local residents, fishermen have been known to come from as far away as Russia to experience the excitement of catching a Crooked River trout.

Based on the criteria and guidelines outlined in the Oregon Department of Fish and Wildlife Wild Fish Policy (WFP) and Natural Fish Production Policy (NFPP), the Crooked River below Prineville Reservoir is managed as a basic yield "wild trout" fishery. The NFPP protects and fosters natural production of fish for the present and future and to perpetuate endemic species; the WFP protects the genetic diversity of endemic fish. Both policies seek to minimize the adverse effects of human activities on the natural production of wild populations.

During the spring of 1989, the ODFW measured high nitrogen saturation levels in the Crooked River. An extensive population inventory and trout tagging project revealed that most of the trout were infected with gas bubble disease. Typically, gas supersaturation occurs as a result of spilled water from a dam plunging into deeper pools in the tailrace area, entrapping gas to a supersaturated level. The BOR is attempting to resolve this problem by raising the floor of the stilling basin below the dam as part of the "Safety of Dams" project.

**Table 5 - Fish Habitat Data Collection, Summer 1991**

| | Averages | | |
|---|---|---|---|
| | Length | Area | Volume |
| High Gradient Riffle | 245.3 | 17,703.6 | 41,627.8 |
| Lateral Scour Pool | 132.3 | 7,808.2 | 22,485.6 |
| Glide | 454.6 | 45,018.1 | 112,216.9 |
| Low Gradient Riffle | 410.8 | 36,084.6 | 54,566.9 |
| Plunge Pool | 37.0 | 592.0 | 1,598.4 |
| Backwater Pool | 129.0 | 1,615.0 | 1,907.5 |

The Confederated Tribes of the Warms Springs have guaranteed treaty rights for "taking fish at usual and accustomed grounds and stations". This includes off-reservation sites such as this segment of the Crooked River.

**Fish Populations**

*Redband/Rainbow Trout.* Studies by ODFW in 1989, indicate that there are two separate populations of trout below the dam. These include, naturalized wild stocks and hatchery fish. Although there are no active stocking programs, the river is managed for both populations. Hatchery fingerlings were released into Prineville Reservoir above the dam up until 1986 when anglers complained of the skinny condition of the fish. Some hatchery fingerlings entered the present native population by passing through Bowman Dam outlet works and spillway and represent 5-25 percent of the catch in the Lower Crooked River below the dam.

Populations are thought to be stable but lower than in the 1960's. Recent information from ODFW studies indicate that there is an average of 826 trout per mile below Bowman Dam. This compares to an estimate of 2,200 trout per mile in the late 1960's. This decline is likely due to 1) a large increase in turbidity in Prineville Reservoir that passes through the dam and which reduces food production and spawning/rearing success; 2) the nutrients flush in Prineville Reservoir (following construction) has been depleted; 3) low flows from drought and irrigation and, 4) a large increase in out-of-stream water appropriations above the reservoir in the 1970's, 5) recent reductions in reservoir stocking, and 6) increased fishing pressure.

*Other Fish Species.* Very little information on population size and distribution is available for the other fish species. A list of these species include: smallmouth bass, coarsescale sucker, mountain whitefish, squawfish, dace and brown bullhead. Bass populations are limited due to the lack of large "holes" or pools. Other limiting factors include low instream flows and cool water temperature.

*Anadromous fish.* Anadromous fish no longer enter this river segment. Historically, runs of coho, kokanee salmon and steelhead utilized key spawning and rearing areas. Construction of Round Butte Dam, Pelton Reregulating Dam, and the diversion dam at Opal Spring now prevents upstream movement.

*Special Status Species.* Redband/rainbow trout inhabit this segment of river. They are considered by the State of Oregon as a "species of concern", which the BLM considers as a special status species. BLM policy requires that all management actions, planned or developed that would affect these species or their habitat, would not contribute to the need to list these species under the Endangered Species Act.

Opportunities exist to increase natural production of wild redband/rainbow trout. A rough estimate is that population could be increased by three times to nearly the same size as the late 1970's. In order to increase fish populations and ensure that this river segment retains its outstandingly remarkable values, minimum instream flows would need to be determined and recommended.

Historically, bull trout, a "species of concern", from Lake Billy Chinook/Metolious system were caught in the Crooked River. The extent of their migrations are unknown but anglers reported catching bull trout as recently as the late 1970's. Passage was eliminated with the reconstruction of the diversion dam at Opal Springs in 1982 to accommodate hydroelectric power.

### Fish Habitat

This segment of river is characterized by six different habitat types. They are in descending order of frequency. Low gradient riffles, glides, lateral scorn pools, high gradient riffles, backwater pools, and plunge pools. The largest habitat type by area is the glide with an average size of 45,018 square feet. Table 5 displays the average size for all habitat types.

Overall, low gradient riffles and glides are the dominate habitat type comprised of 43.7 percent and 39.8 percent, respectively. Ratio of these two habitats to each other is very near the ideal ratio of 50:50.

The frequency of vegetative cover over the stream or canopy close was low with 7 out of 45 low gradient riffles and 6 out of 41 glides having cover. However, natural requirement of woody structure was very frequent, with 44 out of 45 low gradient riffles and 19 out of 41 glides showing this potential. Recruitment is the total number of trees greater than 2 feet in diameter at breast height that could fall into the stream channel. Wood structures provide substrate for fish food production and cover for fish and is very important in sustaining high fish productivity and biodiversity. Overall, fish habitat in this segment exhibits a high degree of diversity, provides spawning, rearing, and adult habitat. Productivity and diversity are comparable to the Deschutes River which has better water quality in terms of turbidity, flow, and temperature.

### Wildlife

In an area where streams and springs are rare, the Lower Crooked River fills a very important role and is the center for many wildlife populations. A great diversity of species are found within the riparian, juniper, shrub, grass, and big sage/grass vegetative habitats along the river.

### Wildlife Populations

Wildlife populations in the corridor are managed by the Oregon Department of Fish and Wildlife. In 1982, big game populations within the corridor and on lands directly adjacent to the area were estimated as shown in Table 6.

Waterfowl utilize the Lower Crooked River corridor for feeding, nesting, brood rearing, and resting/loafing. At least 13 species of waterfowl have been observed in or near this river segment. Many resident and migrant species of waterfowl occupy the river's open water year round, unless winter freeze-up occurs. State Scenic Highway 27 makes viewing of waterfowl an exceptional opportunity.

Upland game bird species such as mourning doves, rock doves, chukar, and California valley quail exist within this segment of river. They utilize the rocky cliffs, slopes, riparian zone for nesting, feeding, and as a source of water. Non-game bird species such as great blue herons, kingfishers, shorebirds, raptors, and songbirds also utilize the important riparian area.

It is estimated that at least 101 species of non-game birds, including 13 raptorial, 10 shore or wading, and 78 insectivorous or seed-eating perching species use this corridor. These species include both permanent residents and seasonal migrants. This tremendous number and variety is possible due to the richness and diversity of habitats associated with the river and adjacent upland areas.

The Bald Eagle, a threatened species, winters in the Lower Crooked River corridor. Historical reports indicate that the corridor supported their nesting in the past. Osprey and golden eagles also are known to seasonally visit the corridor. Observations of wintering eagles, particularly Bald Eagles, has shown a steady increase. In recent years, counts have ranged

between 8 to 10 birds, with the majority of them being Bald Eagles. State Highway 27 enables viewing of eagles throughout the winter.

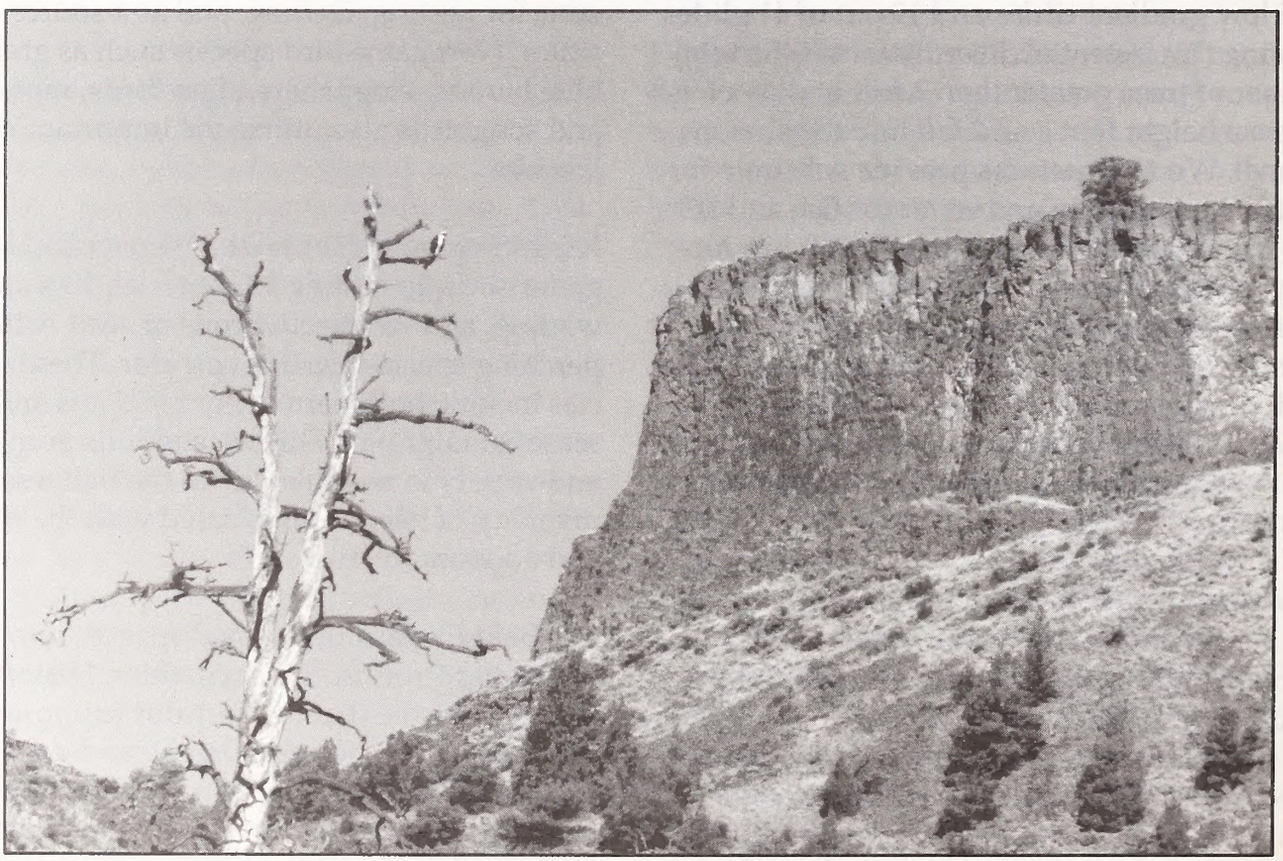
Both resident and wintering populations of mule deer reside within the corridor. The area has been identified as crucial mule deer winter range and supports a significant wintering population from the Ochoco and Paulina range units. A small population of wintering antelope also occupy the western edge of the river corridor.

Furbearers such as bobcat, skunk, coyote, muskrat, raccoon, river otters, mink, and beaver utilize the river corridor for feeding, denning, and rearing their young. The river and riparian area remains important as a source of water and prey.

**Wildlife Habitat**

Upland and Riparian vegetation communities in association with the river provide a diversity of wildlife with valuable food and shelter. With few exceptions, the majority of the upland slopes are in late-seral or better ecological condition. Ecological conditions within the riparian area vary between early and late seral. The corridor is in line with migratory patterns of mule deer, neo-tropical migrants, and a variety of other animals. Proper functioning vegetative communities provide forage and shelter seasonally for these animals.

Open water availability during the winter is crucial to waterfowl, a variety of raptors, and other river dependent wildlife. The west side of the river corridor and the upland slopes east of



*Osprey perched in snag near Lower Palisades*

**Table 6 - Estimated Wildlife Populations**

| Species | Estimated Population |
|---|---|
| Mule Deer | |
| Crucial winter range | 350 |
| Summer range | 150 |
| Antelope | |
| Crucial winter range | 50 |
| Summer range | 50 |
| Water Associated Birds (includes surface water acres) | Moderate to Abundant |
| Upland Game Birds | |
| Stream riparian habitat | Low to Moderate |
| Nongame Species | |
| Yearlong range | Moderate to Abundant |

Highway 27 are fairly inaccessible providing wildlife more protection from the visiting public. Increasing recreation use on the east side between the river and the highway continues to disturb and displace wildlife. Continued monitoring of wildlife habitat and levels of use ensure protection of threatened, endangered and sensitive animal species.

**Cultural Resources**

Travel, lodging, and fishing by Native American people and early Euroamerican settlers may have occurred along this river segment. Ethnographic data indicates that Indian groups belonging to the Penutian and Aztec-Tanoan linguistic groups used the area for hunting and gathering. Early fur traders, immigrants looking for a quicker or easier route west, and soldiers on trail blazing and military expeditions all explored the general vicinity of the Crooked River.

The Lower Crooked River is within the Ceded Lands of the Confederated Tribes of the Warm Springs Indian Reservation. The river was used as a gathering place for riparian resources as well as resident fish collection.

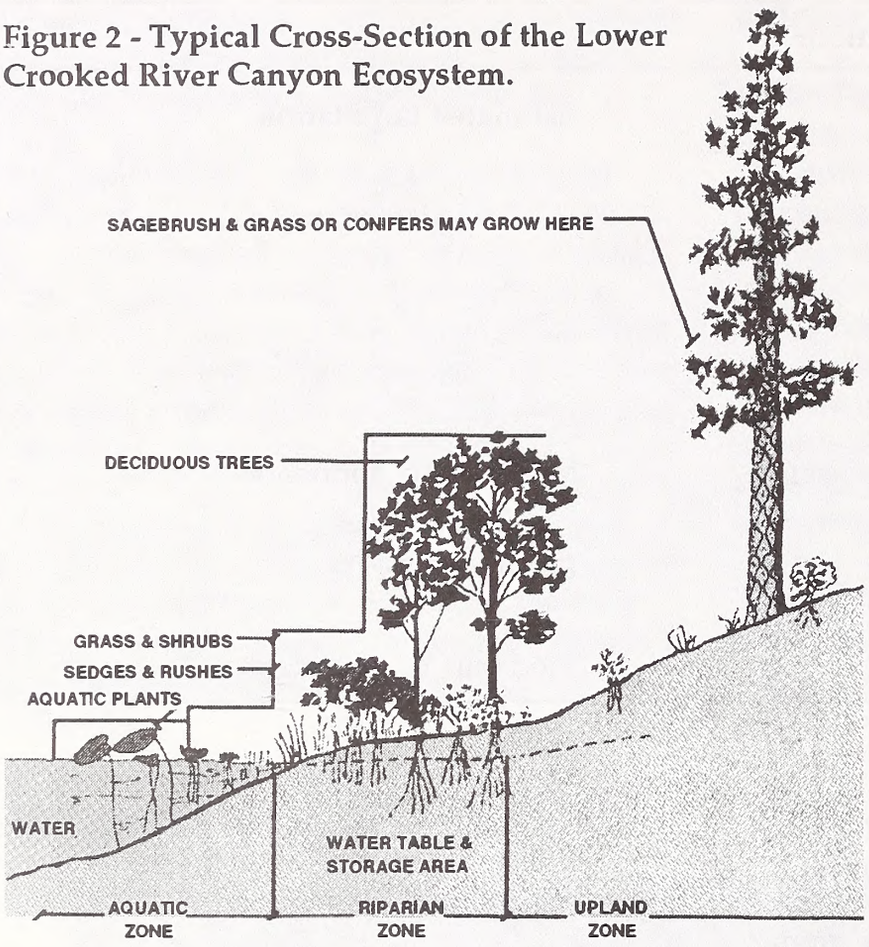
No systematic cultural resource inventories have been completed for the river corridor. Some preliminary investigations have indicated that some prehistoric use occurred on the river benches.

Cultural resource inventories within high probability use areas indicate some prehistoric use, qualifying this area as having significant cultural resource values. These values do not meet outstandingly remarkable criteria because other similar areas within the region contain better examples of cultural resources. Known and discovered sites are protected under existing statutes, regulations and policy.

**Vegetation and Ecology**

Vegetation along the Lower Crooked River is found within two distinct communities, riparian and upland. A typical cross-section of the

**Figure 2 - Typical Cross-Section of the Lower Crooked River Canyon Ecosystem.**




Lower Crooked River canyon ecosystem can be found in Figure 2.

The riparian community occurs immediately adjacent to the river and in occasional seeps and springs elsewhere in the canyon. Dominant species include willows (*Salix* spp.), sedges (*Carex* spp.), rushes (*Juncus* spp.) and grasses, such as Kentucky bluegrass (*Poa pretensis*) and redtop (*Agrostis alba*). Other shrubs including red-osier dogwood (*Cornus stolonifera*) and mock-orange (*Philadelphus lewisii*) can also be found.

The riparian community, although in an improving condition, still bears the marks of past use. This is evidenced by dense stands of teasel (*Dipsacus sylvestris*) and nettle (*Urtica dioica*) in some locations. In addition, the extreme fluctuation of the river allows for areas inundated in the spring to become dry by summer, creating space for pioneer plants such as sweetclover (*Melilotus* spp.) to flourish, if only for a season.

The upland community occupies the area from the riparian community to the top of the canyon, and while the aspect is of a western juniper (*Juniperus occidentalis*) community with an understory of sagebrush (*Artemisia* spp.) and grass, in reality there are at least five main habitat types: river terrace, vegetated slopes, sandy flats, rock talus and rock outcrops.

The river terrace, or the flat, deep-soiled area just above the river, is generally in a disturbed condition and is occupied by western juniper, basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*), rabbitbrush (*Chrysothamnus* spp.), western needlegrass (*Stipa occidentalis*) and cheatgrass (*Bromus tectorum*). Ponderosa pine (*Pinus ponderosa*) is scattered along the river in this habitat type as well as on the lower vegetated slopes.

The vegetated slopes are generally steep and occupied by western juniper (dense to scattered), Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), arrowleaf balsamroot (*Balsamorhiza careyana*) and bluebunch wheatgrass (*Agropyron spicatum*). On northerly slopes or on sites with some shading, Idaho fescue (*Festuca idahoensis*) is also present. With few exceptions, the majority of these slopes are in late-seral or better ecological condition.

The sandy flats occur within the lower portion of the vegetated slopes and are areas of sand dominated by western needlegrass, Indian ricegrass (*Oryzopsis hymenoides*) and purple sage (*Salvia dorii*). Western juniper and sage-

brush are also present. Due to the gentle topography of these areas and their general proximity to water, some are in early to mid-seral condition.

The rock talus, although appearing void of vegetation, actually supports many small forbs such as bedstraw (*Galium* spp.) and phacelia (*Phacelia* spp.). In similar fashion, the rock outcrops (which includes the rimrock) have their own floral denizens including Richardson's beardtongue (*Penstemon richardsonii*) and wire-lettuce (*Stephanomeria* spp.).

Historically, the river terraces and vegetated slopes were primarily a grassland, dominated by bluebunch wheatgrass. Western juniper, now dominant on many of the lower slopes and terraces was restricted to the rockier areas where fire could not carry. In the absence of fire, juniper out-competes most associated species for limited soil moisture. With European settlement of the west, wildfire suppression and reduced fine fuels have decreased fire frequencies, allowing juniper to encroach into former fire-maintained grasslands. As the juniper density and cover increases, the grass, forb, and shrub components decrease. The community may eventually reach a point where the understory vegetation can not carry a fire, and the remnant grasses and forbs are not capable of repopulating the area even if the juniper were removed. Future management of this area would allow for some reintroduction of fire, either naturally or artificially, to prevent conversion of sagebrush grasslands to juniper woodlands, reduce erosion, and maintain the diversity of the plant and animal communities.

Livestock grazing (River Pasture, No.5137) within the corridor has not occurred in twelve years, allowing the upland slopes to return to natural ecological conditions. As defined in the Brothers/LaPine Resource Management Plan, future use may be allowed if it is designed to enhance the ecosystem and would be limited to a short period of grazing, primarily in the late winter/early spring before significant visitor use begins. Five other grazing pastures finger into the wild and scenic river corridor but remain unseen from the canyon floor. They are also managed as defined in the Brothers/LaPine Resource Management Plan.

**Table 7 - Average Resident Labor Force, Crook County**

| Category | 1988 | 1990 |
|---|---|---|
| Labor Force | 6,930 | 7,320 |
| Unemployed | 500 | 480 |
| Percent of labor force | 7.2% | 6.6% |
| Employed | 6,430 | 6,840 |
| Agriculture | 1,700 | 1,660 |
| Manufacturing | 1,840 | 2,040 |
| Service | 2,890 | 3,140 |
| Trade | 940 | 1,100 |
| Government | 930 | 940 |
| Other | 1,020 | 1,100 |

Source: State of Oregon, Employment Division, Department of Human Resources, April 1991

There are no known populations or historical records of endangered, threatened or special status plants in the wild and scenic river corridor. Suspected species include: Estes' wormwood (*Artemisia ludoviciana* ssp. *estesii*), a Category 2 candidate for Federal listing known from the Upper Deschutes River; bristle-flowered collomia (*Collomia macrocalyx*), a BLM tracking species known from rocky areas east of the river corridor and scaposa catchfly (*Silene scaposa* var. *scaposa*), another tracking species known from an area just north of the corridor.

The overall botanical/ecological make-up of the river corridor is important to the scenic, recreation and wildlife values. It provides cover and food for wildlife, visual pleasure to recreationists and plays a major role in the outstandingly remarkable scenic value identified by Congress. For this reason the botanical/ecological resource is found to be significant. This finding may change if future studies determine that threatened and endangered, or sensitive species actually exist.

### Air

Air quality in the river corridor is excellent, with visibility limited only by the terrain. Minor localized sources of air pollution in the canyon exist in the form of automobile exhaust, road dust, and smoke from adjacent field burning. Campfires are prohibited during most of the high use season, so are not a threat to air quality.

### Socioeconomics

The river corridor lies entirely within Crook County, Oregon. The 1990 population was estimated at 14,100. Prineville, the county seat, is the county's only incorporated city and has a population of 5,435. The county is expected to experience negligible growth through the end of the century, reaching potentially as high as 20,000 people. There has been a steady decline in the 0 - 14 age bracket and a significant increase in those 65 years or older.

The county economy is based on agricultural, manufacturing, and a variety of service businesses as shown in Table 7. General sub-elements related to these include: ranching, farming, lumber mills, outdoor recreation, retail trade, and government agencies.

Crook County enjoys the recognition of being included in Central Oregon's recent label of being rated fifth in the state for tourism spending. Prineville is strategically located in route to many outdoor recreation pursuits to the east and is home to tourism entities such as Prineville Reservoir and the Ochoco National Forest. Another of these areas is the Lower Crooked River corridor which provides year round recreation opportunities helping support a stable tourism trade in Crook County. The Crook County Comprehensive Plan states "It is difficult to predict which or how many new industries will be attracted to the area to bolster the economy, but it is probable that economic development will occur in recreation and in support of a retirement community."

Predictions concerning community growth include the assumptions of: 1) employment growth in the lumber and wood products industries will be low, 2) new industries in the area will be of the types to utilize the existing pool of low skilled labor and will attract very little outside labor force, and 3) retirees will come primarily from the Willamette Valley and California and will settle in or very near the city limits of Prineville.

# *IV. Environmental Consequences*

## Introduction

This chapter identifies, summarizes, and compares environmental impacts of each alternative on the affected environment - the river corridor resources and land uses described in Chapter 3. In each of the following sections, the impacts to resources and uses that would occur if no additional actions are taken are described under Alternative 1. The impacts of Alternatives 2, 3, 4, and 5 to resources and uses are estimated based on the additional actions that would be taken under each alternative. Not all impacts were quantifiable because of the lack of quantifiable data. An interdisciplinary team of resource specialists used professional judgement to estimate environmental consequences where specific data was lacking.

Impacts to management actions are discussed primarily in the same sequence as in Chapter 3, except impacts to soils and vegetation, and fish and water resources (instream resources) were consolidated for ease of analysis. Analysis indicates there would be no significant impact to climate, utilities, geology, and mineral resources. They will not be considered further.

Where appropriate, tables which summarize the impacts to the alternatives on each resource have been developed. Beneficial impacts are shown by a "+" indicating a positive change from present conditions. Adverse impacts are denoted by a "-" and indicated a decrease or negative change from present conditions. The letters "L, M, or H" are used to indicate the degree or severity of change from present conditions with "L" (low) indicating a relatively small change from present condition and "M" (moderate) denoting an increasingly more significant change from present condition and "H" (high) indicating a dramatic change.

Many management actions as described by the alternatives and management actions common to all alternatives have been analyzed in the Brothers/LaPine Resource Management Plan and Environmental Impact Statement. These documents are available upon request at the BLM, Prineville District Office.

## Impacts to Scenery

Impacts to scenery would result from management of roads and trails, camping and day use areas, vegetation and water resources. They are summarized in Table 8 and described below.

Management actions as described in the alternatives would primarily result in changes in visitor experience.

### Alternative 1 (No Action)

Current management of the ten existing campgrounds and a variety of undefined day use areas would result in localized long-term impairment of scenic quality by means of vegetation loss associated with undefined use areas.

Landscape characteristics of the area would remain unchanged as a result of existing facilities remaining subordinate to the surrounding landscape.

By allowing unrestricted non-motorized access within the corridor, loss of vegetative cover and soil erosion would continue to degrade scenic quality in limited site specific areas.

Limiting motorized vehicle use to designated roads would enhance scenic quality as a result of decreased soil and vegetation disturbance.

Landscape characteristics within the riparian area would remain unchanged as a result of installing naturally appearing stream bank protection structures.

Vegetation and wildlife habitat management strategies such as prescribed fire and mosaic juniper thinning would result in short-term inconsistent landscape characteristics such as irregular blackened areas, bare soil areas, dead and/or down trees, and irregular vegetation patterns.

**Alternative 2**

Designating use sites and hardening facilities with basic site protection measures in eight campgrounds and two day use areas would enhance site specific scenic quality by confining use to these areas and rehabilitating previously disturbed areas. Just as discussed in Alternative 1, existing facilities would remain subordinate to the surrounding landscape resulting in unchanged landscape characteristics. Short-term visual impacts would occur as a result of resource disturbance during construction.

Excluding camping and encouraging use of existing user developed trails on the west side of the river would reduce indications of human presence.

Re-routing and rehabilitating existing non-motorized multiple use trails within the corridor would enhance scenic quality in site specific areas by reducing soil erosion and encouraging regrowth of vegetation in previously disturbed areas.

Limiting motorized vehicles to designated roads, closing and rehabilitating undesignated roads, and stabilizing and applying gravel to campground entrance road aprons would result in increased vegetative cover thus, enhancing scenic quality in previously disturbed areas. Short-term visual impacts would occur as a

**Table 8–Summary of Impacts to Scenery**

| Managing: | Alt1 (NoAction) | Alt 2 | Alt 3 | Alt 4 | Alt 5 (Pref) |
|---|---|---|---|---|---|
| Campgrounds/Day Use Areas | -L | +L | +L | -L | +L |
| Facilities | NC | NC | NC | NC | NC |
| Trails/Use | -L | +L | +L | -L | +L |
| Roads/Vehicle Use | | | | | |
| Closures | -L | +L | +M | +M | +L |
| Upgrading | NC | +L | +L | -L | +L |
| Parking | -L | +L | +M | -L | +L |
| Instream Resources | NC | NC | +L | +L | +L |
| Vegetation | NC | NC | +L | -L | NC |
| Overall | -L | +L | +L | -L | +L |

\+ Beneficial
\- Adverse
NC No Change
H High
M Medium
L Low
NA Not Applicable

result of resource disturbance during construction.

Designating and constructing three boat launching/landing areas would eliminate riparian vegetation in these areas resulting in visual inconsistencies along the river. However, adjacent riparian vegetation would be allowed to rehabilitate naturally and would provide enhanced visual screening. Short-term visual impacts would occur as a result of resource disturbance during construction.

Encouraging natural bank stabilization methods would benefit scenic quality within the riparian area as a result of using materials that blend into the surrounding landscape.

Vegetation and wildlife habitat management strategies such as prescribed fire and mosaic juniper thinning would result in the same impacts to scenic quality as discussed in Alternative 1.

**Alternative 3**

The impact of managing ten campgrounds, five day use areas, and facilities would be the same as discussed in Alternative 2, except major site protection measures such as installation of vehicle barriers and designation of campspurs would provide more effective long-term benefits to scenic quality by allowing vegetative screening between sites to grow unimpeded.

Excluding camping and encouraging use of existing user developed trails on the west side of the river would result in the same impacts as discussed in Alternative 2.

Designating non-motorized multiple trail use on the east side of the river in the riparian and upland areas and constructing 4.5 miles of new trail east of Highway 27 would result in short-term visual impacts due to soil disturbance and vegetation loss during construction. Except for in the immediate areas near the trailheads, the trails would remain subordinate to the surrounding landscape.

Limiting motorized vehicles to designated roads, closing rehabilitating undesignated roads, and stabilizing and applying gravel to campground entrance road aprons would result in the same impacts as discussed in Alternative 2, except re-routing roads out of the riparian area and specifying trails for walk-in boat launching/landing would enhance scenic quality in the riparian areas by increasing vegetative cover.

Requiring natural bank stabilization methods in most circumstances would result in the same impacts to scenic quality as discussed in Alternative 2.

Impacts to scenic quality from management of vegetation and wildlife habitat would be the same as discussed in Alternative 1, except discontinuing juniper thinning would allow trees to grow until prescribed burning takes place - eliminating dead and/or down tree visual inconsistencies.

**Alternative 4**

The impact of managing campgrounds, day use areas, and facilities would be the same as discussed in Alternative 3, except enlarging use areas and allowing walk-in camping on the west side of the river directly across from Chimney Rock campground would increase human presence resulting in impacts to scenic quality. Opening up these areas facilitates a permanent loss of natural scenic resources by reducing visual screening and changing natural landscape characteristics.

Designating non-motorized multiple use on the east side of the river in the riparian and upland areas and constructing 4.5 miles of new hiking trail east of Highway 27 and a 7 mile loop trail

crossing a bridge to the west side at Chimney Rock campground would result in short-term visual impacts due to soil disturbance and vegetation loss during construction. Except for in the immediate area near the trailheads and the bridge, the trails would remain subordinate to the surrounding landscape.

Impacts of managing motorized vehicles, roads, and parking areas would be the same as discussed in Alternative 3, except surfacing all campground roads with oil/gravel would change the landscape character to a more developed setting.

Always requiring natural bank stabilization methods would result in the same impacts to scenic quality as discussed in Alternative 2.

Impacts to scenic quality from management of vegetation and wildlife habitat would be the same as discussed in Alternative 3, except suppressing upland enhancement projects until regrowth of juniper occurs would result in long-term visual impacts associated with a loss of vegetative diversity due to juniper competition and soil erosion.

**Alternative 5 (Draft Preferred)**

The impact to scenic quality by designating use sites and hardening facilities in nine campgrounds and five day use areas would be the same as discussed in Alternative 2.

Excluding camping and encouraging use of existing user developed trails on the west side of the river would have the same impacts to scenic quality as discussed in Alternative 2.

Management of non-motorized use trails on the east side of the river in riparian and upland areas and constructing 4.5 miles of new trail would have the same impacts to scenic quality as discussed in Alternative 3.

Limiting motorized vehicles to designated roads, closing and rehabilitating undesignated motor vehicle routes, and prohibiting vehicle access into the river, except at three boat launching/landing areas, would result in the same impacts to scenic quality as discussed in Alternative 2.

Requiring natural bank stabilization methods in most circumstances would result in the same impacts to scenic quality as discussed in Alternative 2.

Management of vegetation and wildlife habitat would result the same impacts to scenic quality as discussed in Alternative 2.

## Impacts to Recreation

Recreation opportunities are made up of the physical and biological environment (including the character of the landscape, level and type of development present, and fish and wildlife) the social environment (the amount and type of people who use the recreation setting, what activities they do, and what type of experiences they have), and the managerial environment (the level, type and location of public access facilities and improvements, interpretation and education efforts, and on and off-site regulations). Changes in any of these characteristics could change the type of recreation use or recreation experience occurring in the river corridor.

Management actions as described by the alternatives would result in direct and indirect impacts on recreation use and experience within the river corridor. They are summarized in Table 9 and described below.

**Alternative 1 (No Action)**

Current management of the ten existing campgrounds and a variety of undefined day use

*Litter, freshly cut juniper limbs, and an extremely large rock firing at Lower Palisades*

areas, would result in continued competition and conflicts among users and long-term impacts to the surrounding environment in the form of compacted soils, trampled vegetation, and fire rings. The quality of user experience would decline as a result of physical changes around campsites and other undefined use areas. Users would, however, retain a sense of freedom as a result of unrestricted use. Requiring camping fees in four of the existing campgrounds would not change recreation use or experience.

Existing facilities would remain subordinate to the surrounding environment allowing visitors to experience a relatively natural environment. Continued enhancement of facilities for barrier-free access would result in increased access for physically challenged users. Impacts in use areas where facilities do not exist would continue in the form of waste and litter.

Allowing unrestricted non-motorized access within the corridor would result in short and long-term impacts to recreation. User experience would benefit in the short-term as a result of ease of access for recreation activities such as exploration, wildlife observation, and fishing access. Although users would have unlimited access, the quality of their experience would decline in the long-term because of physical changes on and adjacent to the trails.

Upgrading roads experiencing heavy degradation and limiting motorized vehicles to designated roads would improve access and enhance recreation experience by limiting physical changes in adjacent areas.

**Table 9–Summary of Impacts to Recreation**

| Managing: | Alt1 (NoAction) | Alt 2 | Alt 3 | Alt 4 | Alt 5 (Pref) |
|---|---|---|---|---|---|
| Campgrounds/Day Use Areas | -L | +L | +L | +M | +L |
| Facilities | -L | +L | +L | +L | +L |
| Fees | NC | NC | -L | -L | -L |
| Trails | -L | -L | +L | +L | +L |
| Roads/Vehicle Use | | | | | |
| Closures | -L | +L | +L | +L | +L |
| Upgrading | NC | +L | +L | +M | +L |
| Parking | -L | +L | +L | +L | +L |
| Overall Recreation Use | | | | | |
| Quantity of Use | NC | NC | -L | -M | -L |
| Quality of Experience | -L | +L | +L | -L | +L |
| Instream Resources | -L | -L | +L | +L | +L |
| Vegetation | NC | NC | +L | -L | NC |
| Information/Education | NC | +L | +M | +M | +M |
| Overall | -L | +L | +L | +L | +L |

\+ Beneficial
\- Adverse
NC No Change
H High
M Medium
L Low
NA Not Applicable

Prohibiting cutting of firewood for personal use within the corridor could affect some users by limiting their ability to have a traditional campfire during open fire season if they do not bring their own firewood.

Continuing to allow commercial use in the corridor would result in the provision of long-term services to those seeking the use of professionals to enhance their personal recreation experience. If guided use increases significantly, some conflicts may arise with the non-guided public. Physical restrictions limit commercial use within the river corridor. Therefore, any increase in use is expected to be minimal.

Indiscriminate shooting, target shooting, and hunting within campgrounds without sufficient boundary delineation and in areas directly adjacent to campgrounds would reduce visitor safety and increase noise related to discharge of firearms. Users that enjoy target shooting and plinking would continue to enjoy these activities.

Management of fish in the Lower Crooked River corridor would continue to support opportunities for positive recreational fishing experiences. An increase in fishing pressure could require changes in fish regulations in the future.

Vegetation and wildlife habitat management strategies such as prescribed fire and mosaic juniper thinning would result in short-term changes in recreation setting by changing landscape characteristics. These changes could

indirectly effect use patterns for activities such as hunting, hiking, and sight-seeing.

Recreation use levels would remain unchanged as a result of management actions under this alternative.

A limited public information and education program effort would help reduce physical impacts caused by users and would help reduce conflicts between recreation users.

**Alternative 2**

Designating use sites and hardening facilities with basic site protection measures in eight campgrounds and two day use areas would enhance camping experience and minimize environmental degradation and litter in these areas. Users that prefer to camp in undesignated areas would be impacted as a result of limiting camping to designated campgrounds. As discussed in Alternative 1, existing facilities would remain subordinate to the surrounding landscape allowing visitors to experience a relatively natural environment. Short-term impacts to recreation opportunities and experience would occur during construction. Requiring camping fees in two additional campgrounds could effect recreation use and experience by displacing users that prefer free camping.

Installing challenge Level 2 barrier free facilities at the areas listed above as well as installing a challenge Level 1 hardened access trail to the river in Chimney Rock campground would provide easier access and increased recreation opportunity for physically challenged users.

Excluding camping and bike use on the west side of the river would affect those users who prefer more secluded experiences while camping or biking. These activities would be available in a more developed setting on the east side of the river in designated use areas. The west side of the river would remain semi-primitive with a relatively untouched upland landscape that contributes to opportunities for more primitive day use recreation experiences.

Limiting use of bikes and horses on the east side of the river to roads and trails and encouraging horse use on user developed trails on the west side of the river would limit recreation opportunities for these users. Open country horse use on the west side would continue to provide horseback users a well-rounded recreation experience.

Competition and conflicts among east side trail users would increase by forcing bikes and horses into a more limited area. Physical characteristics would also continue to limit both uses.

Re-routing and rehabilitating existing non-motorized multiple use trails within the corridor would provide easier access away from the river. Those users who depend on network trails for fishing access along the river may be impacted as a result of restricted movement within the riparian area. The overall quality of recreation experience in and adjacent to these areas would increase as a result of encouraging regrowth of vegetation and enhancing scenic quality in previously disturbed areas. Short-term impacts would occur as a result of displaced trail users during construction.

Limiting motorized vehicles to designated roads and closing and rehabilitating undesignated roads would result in improved scenic quality and visitor experience by changing the area to resemble a more natural recreation setting. Users that prefer off-road driving would forced to recreate elsewhere. Stabilizing and applying gravel to campground entrance road aprons would facilitate safe, easy access into and out of designated campgrounds. Improving highway parking and pullout areas

would ensure safe parking and easy access parking to the river in many locations.

Designating and constructing three boat launching/landing areas would provide easy boating access. Minimal competition and conflicts between boaters and fishermen could result in these confined areas.

Implementing a fire closure between June 1 and October 15 would impact recreation users who desire a campfire during traditional high use season months. The fire closure would lessen the risk of wildfire and decrease the amount of litter associated with rock fire rings. Prohibiting cutting of firewood for personal use would result in the same impacts as discussed in Alternative 1.

The impacts of allowing commercial use in the corridor would be the same as discussed in Alternative 1.

Management actions prohibiting the discharge of firearms and hunting except during official State Waterfowl, Big Game, and Upland Game seasons would displace other types of uses of firearms and hunting to other areas outside of the river corridor. Reducing indiscriminate shooting and decreasing noise related to firearm discharge would enhance visitor safety and experience. Users that enjoy target shooting and plinking would be displaced to other areas.

Impacts to recreation resulting from management of fish would be the same as discussed in Alternative 1.

Impacts to recreation resulting from management of vegetation and wildlife habitat would be the same as discussed in Alternative 1, except introduction of native and non-native animal species and the installation of nest boxes and platforms would enhance wildlife observation and hunting opportunities in the long-term.

The level of recreation use would be the same as discussed in Alternative 1.

The information and education program could indirectly result in beneficial effects on recreation use and experience by creating user awareness and an understanding of the importance of resource protection through interpretive devices and continued enforcement of rules and regulations.

**Alternative 3**

The impact of managing ten campgrounds, five day use areas, and facilities would be the same as discussed in Alternative 2, except major site protection measures such as installing vehicle barriers and designating campspurs would result in more effective long-term protection of the surrounding physical environment. These measures would help accommodate use in a more controlled social environment. Designating more use sites would broaden opportunities for camping and better distribute use throughout the river corridor. New use sites would be designed to blend into the existing landscape character. However, the higher level of development could impact visitors who prefer less development. Requiring camping fees at all ten campgrounds could effect recreation use and experience by displacing users that prefer free camping to overnight camping areas outside of the river corridor.

Installing barrier free facilities under this alternative would result in the same impacts as discussed in Alternative 2, except easier access in all use areas would provide greater availability of recreation opportunities for the physically challenged.

Excluding camping and bike use on the west side of the river would result in the same impacts as discussed in Alternative 2.

Limiting bikes to designated roads would force those who prefer to ride bikes off-road to seek these opportunities outside of the river corridor. Displacement of off-road bike users would be limited as surveys indicate little bike use occurs within the corridor. Trail users such as hikers and horseback users would have a recreation experience free from mountain bikes.

Limiting horse use on the east side of the river to roads and trails and encouraging their use along user developed trails on the west side would result in the same impacts to recreation as discussed in Alternative 2, except discouraging open country horse use on the west side could impact horseback user experience by limiting the activity area. Competition and conflicts among trail users would likely increase. Developing three horse access areas away from the campgrounds would decrease conflicts with other users by eliminating smells, noises, and presence of horses in these areas.

Designating non-motorized multiple use trails on the east side of the river in the riparian and upland areas and constructing 4.5 miles of new trail east of Highway 27 would result in the same impacts to recreation as discussed in Alternative 2, except trail use would be better dispersed throughout the river corridor. The 4.5 mile trail would allow visitors easy access to the rim areas for hunting, sight-seeing, and wildlife observation opportunities.

Limiting motorized vehicles to designated gravel roads, closing rehabilitating undesignated roads, and stabilizing and applying asphalt to campground entrance road aprons and highway parking and pullout areas would result in the same impacts as discussed in Alternative 2, except re-routing roads out of the riparian area and specifying trails for walk-in boat launching/landing would result in improved scenic quality and visitor experience by changing the area to resemble a more natural recreation setting. Boaters would be impacted by the loss of easy vehicle access for launching/landing. Short-term impacts could result from construction and rehabilitation efforts.

Impacts on recreation by implementing a fire closure between June 1 and October 15 would be the same as discussed in Alternative 2, except impacts to recreation users who desire a traditional rock ring campfire would be minimal as developed fire rings would be installed in all campgrounds.

The impacts of allowing commercial use in the corridor would be the same as discussed in Alternative 1, except commercial guides and outfitters would be impacted by limiting their commercial use to the 1991 historical use ceiling. This moratorium would allow permittees the right to transfer permit privileges. New guides (those not permitted in 1991) may be unable to obtain a commercial use permit.

Management actions prohibiting the discharge of firearms and hunting except during official State Waterfowl, Big Game, and Upland Game seasons would result in the same impacts as discussed in Alternative 2.

Impacts to recreation resulting from management of fish would be the same as discussed in Alternative 1, except increased angling pressure and impacts to fishing experience in the form of competition and conflicts among users could occur as a result of increased publicity, and improvements in access and facilities.

Impacts to recreation resulting from management of vegetation and wildlife habitat would be the same as discussed in Alternative 2.

Overall recreation use levels could increase slightly because of increased publicity, and improvements in access and facilities.

The information and education program could indirectly result in beneficial effects on recre-

ation use and experience by creating user awareness and an understanding of the importance of resource protection through increased interpretive devices and continued enforcement of rules and regulations.

**Alternative 4**

The impact of managing campgrounds, day use areas, and facilities would be the same as discussed in Alternative 3, except enlarging use areas and allowing walk-in camping on the west side of the river directly across from Chimney Rock campground would open up new recreation opportunities for dispersed camping. Walk-in camping on the west side across from Chimney Rock campground would result in increased opportunities for camping in a more primitive setting. Allowing camping only by reservation in group sites would reduce the number of recreation users within the river corridor and as a result could potentially reduce group camping use. The recreation experience for those getting reservations would be enhanced, however there would be an inconvenience to the camping public with having to make reservations. Those users without reservations would be displaced to other areas. Impacts to recreation as a result of requiring camping fees at all overnight campgrounds would be the same as discussed in Alternative 3.
Installing barrier free facilities under this alternative would result in the same impacts as discussed in Alternative 3.

Excluding camping on the west side of the river except for the primitive area across from Chimney Rock campground, would result in the same impacts as discussed in Alternative 2.

Limiting bikes to designated roads would result in the same impacts as discussed in Alternative 3.

Limiting horse use to the highway only would severely lessen opportunities for horseback use and would displace many of these users to areas outside of the river corridor. Surveys indicate little horse use actually occurs, therefore, only small numbers of actual users would be displaced. Competition and conflicts among trail users would likely decrease.

Designating non-motorized multiple use on the east side of the river in the riparian and upland areas and constructing 4.5 miles of new hiking trail east of Highway 27 and a 7 mile loop trail crossing a bridge to the west side at Chimney Rock campground would result in the same impacts as discussed in Alternative 3, except the bridge would make the west side much more accessible and likely increase use. Boaters could be forced to portage around the bridge during high flows.

Impacts of managing motorized vehicles, roads, and parking areas would be the same as discussed in Alternative 3, except surfacing all campground roads with oil/gravel would provide better access for recreation vehicles. The surfaced roads would change the landscape character of the campgrounds to a more developed setting possibly impacting recreation experience for some users. Campers desiring a more primitive setting would likely be displaced by recreation vehicles.

Impacts on recreation by implementing a fire closure between June 1 and October 15 and other fire restrictions would be the same as discussed in Alternative 3.

Excluding commercial use within the corridor would impact six commercial businesses which currently have permits by eliminating potential economic income. Recreation users desiring guide services would lose the opportunity to recreate on this section of the Lower Crooked River.

Prohibiting discharge of firearms, hunting, and trapping in the river corridor would totally eliminate an established recreation activity

within the river corridor. These users would be displaced to other areas outside of the river corridor. Eliminating indiscriminate shooting and decreasing noise related to firearm discharge would enhance visitor safety and experience for other recreationists.

Impacts to recreation resulting from management of fish would be the same as discussed in Alternative 3.

Impacts to recreation from management of vegetation and wildlife habitat would be the same as discussed in Alternative 2.

Use levels would be expected to increase moderately because of increased publicity, and improvements in access and facilities. This use would not be allowed to degrade outstandingly remarkable values within the river corridor. The recreation monitoring and management framework would be designed to accommodated increased use while protecting resources. Limits on use numbers would be used only as a last resort and are not anticipated to be needed in the foreseeable future. Federal designation provides for management of on-water recreational use, providing a mechanism for regulating use should it be needed.

Impact to recreation resulting from management of the information and education program would be the same as discussed in Alternative 3.

*This wood fence at Chimney Rock campground helps protect adjacent soils and vegetation while providing visitor use safety*

**Alternative 5 (Draft Preferred)**

The impact to recreation by designating use sites and hardening facilities in nine campgrounds and five day use areas would be the same as discussed in Alternative 2.

Requiring fees in all overnight campgrounds would result in the same impacts to recreation as discussed in Alternative 3.

Installing barrier free facilities under this alternative would result in the same impacts as discussed in Alternative 3.

Excluding camping and encouraging use of existing user developed trails on the west side of the river would have the same impacts to recreation as discussed in Alternative 2.

Management of non-motorized use trails on the east side of the river in riparian and upland areas and constructing 4.5 miles of new hiking trail in the upland would have the same impacts to recreation as discussed in Alternative 3.

Impacts of limiting use of horses on the east side of the river to roads and trails and encouraging use of user developed trails on the west side of the river would have the same impacts to recreation as discussed in Alternative 2.

Limiting vehicles and mountain bikes to designated roads, closing and rehabilitating undesignated roads, and prohibiting vehicle access into the river, except at three boat launching/ landing areas, would result in the same impacts to recreation as discussed in Alternative 2.

Stabilizing and applying asphalt to campground entrance road aprons and highway parking and pullout areas and applying gravel to campground network roads would result in the same impacts to recreation as discussed in Alternative 2.

Impacts on recreation by implementing a fire closure between June 1 and October 15 would be the same as discussed in Alternative 3.

The impacts of managing commercial use in the corridor would be the same as discussed in Alternative 1.

Management actions prohibiting the discharge of firearms and hunting except during official State Waterfowl, Big Game, and Upland Game seasons would result in the same impacts to recreation as discussed in Alternative 2.

Impacts to recreation resulting from management of fish would be the same as discussed in Alternative 1.

Management of vegetation and wildlife habitat would result the same impacts to recreation as discussed in Alternative 2.

Overall recreation use levels could increase slightly because of increased publicity, and improvements in access and facilities.

The information and education program would result in the same beneficial impacts as discussed in Alternative 3.

## Impacts to Fish and Instream Resources

Impacts to fish and instream resources would result from management of roads and trails, camping and day use areas, vegetation, fish and water resources. They are summarized in Table 10 and described below.

Management actions as described in the alternatives would primarily result in changes in aquatic habitat, fish populations, water quality, soil stability, and riparian vegetation. Flow scenario themes are incorporated for analysis purposes only. They are <u>not</u> management actions. Determination of minimum instream

flows is outside the scope of this management plan.

**Alternative 1 (No Action)**

Management of campsites and day use areas currently existing in the riparian area would indirectly impact water quality. Increased camping and day use could result in lessened water quality due to littering, soap use, and trampling which would cause bank erosion, sedimentation, and turbidity.

By allowing unrestricted non-motorized access within the corridor there would be a loss of vegetative cover, an increase in soil erosion, and minor increases turbidity that would result in impacts to water quality.

Upgrading roads experiencing heavy degradation and limiting motorized vehicles to designated roads would increase vegetative cover in previously impacted areas reducing water quality problems related to erosion.

The Bureau of Reclamation's goal is to allow minimum releases of 75 cubic feet per second (cfs) during the winter months when feasible. It is not known whether this would sustain a viable population of native fish in the long-term because of the unpredictable manner in which flows are released. The following analysis of the minimum flow required by law is intended to understand potential impacts to fish and other instream resources. The year-round minimum flow scenario of 10 cfs would result in long-term impacts to fish by reducing the amount of

**Table 10–Summary of Impacts to Fish and Instream Resources**

| Managing: | Alt1 (NoAction) | Alt 2 | Alt 3 | Alt 4 | Alt 5 (Pref) |
|---|---|---|---|---|---|
| Campgrounds/Day Use Areas | -L | +L | +L | +L | +L |
| Trails/Use | -L | +L | +M | +M | +M |
| Roads/Vehicle Use | | | | | |
| Closures | -L | +L | +M | +M | +M |
| Upgrades | NC | +L | +M | -L | +M |
| Parking | NC | +L | +L | +L | +L |
| Flow Scenario | -M | -L | +M | +M | +M |
| Water Quality | -L | +L | +L | +L | +L |
| Fish Habitat | NC | +L | +M | +M | +L |
| Riparian Vegetation | NC | NC | +L | +L | +L |
| Overall | -L | +L | +M | +M | +M |

\+ Beneficial
\- Adverse
NC No Change
H High
M Medium
L Low
NA Not Applicable

aquatic habitat which in turn would limit the amount of space, shelter, and food supply for fish communities. During the summer, water temperatures would increase and dissolved oxygen would decrease resulting in fish mortality. During the winter, ice formation would eliminate rearing habitat. Fish populations would shoal into smaller areas where there would be an increase in competition for food and survival. Fish populations would continue to be impacted.

Flood control measures during high run-off period which increase streamflow from a minimum flow of 10 cfs to 3,000 cfs could result in short-term turbidity, scouring of fish habitat, and flushing fish downriver.

The lack of routine water quality monitoring could indirectly impact fish communities by allowing water quality problems to continue undetected for short-periods of time.

The continuing escapement of hatchery fingerlings into the river from Prineville Reservoir through the dam outlet works would impact wild fish populations through hybridization and competition for food.

Achieving a proper functioning riparian area would benefit fish communities in the long-term by increasing overhead cover and food source, increasing shade, reducing insulation rate, and slowing the rate of increasing water temperatures.

Streambank erosion control, diversions, and other bank protection structures would lower sediment load into the river which would result in enhancement of spawning areas and improve the health and well being of fish. Short-term impacts to water quality would result from soil disturbance during construction.

Use of chemicals on noxious weeds in upland areas could result in an unquantifiable rate of mortality to aquatic life and the creation of a short-term zone of biological degradation. There would be a decrease in aquatic productivity and biodiversity.

**Alternative 2**

Improving campsites and day use areas located in the riparian area by rehabilitating or temporarily closing degraded sites would have a beneficial effect on fish and water quality due to vegetative recovery, improved soil condition, and reducing sediment load in the river.

Re-routing and rehabilitating existing non-motorized multiple use trails within the corridor would result in a beneficial effect on fish and water quality by reducing sediment load. Short-term impacts would result from initial construction and rehabilitation.

Closing and rehabilitating roads not designated would result in new and increased plant growth in previously impacted areas, benefiting soil stability, decreasing erosion and turbidity, and resulting in improved fish habitat and water quality.

Designating three boat launching/landing areas could result in minor short-term impacts to fish and water quality created by petroleum products coming from vehicles that enter the river and from the initial construction of the project.

The year round minimum flow scenario of 30 cfs in drought years and 75 cfs in normal "good water" years would result in long-term benefits to fish and water quality. In the long-term there would be an unquantifiable increase in fish habitat and communities, fish survival, and fitness compared to the situation as discussed in Alternative 1. There would be an unknown increase in survival in young fish.

Impacts to fish and water quality as a result of flood control management would be the same as discussed in Alternative 1.

Coordination with the State Department of Environmental Quality to enforce water quality non-degradation policy would result in beneficial effects on fish and water quality through increased water quality monitoring.

Impacts of managing the riparian area to achieve proper functioning condition would be the same as discussed in Alternative 1, except riparian area restoration would improve fish and water quality at an accelerated pace.

Impacts of managing streambank enhancement projects on fish and water quality would be the same as discussed in Alternative 1. Escapement of hatchery fingerlings into the river from Prineville Reservoir would continue.

Installation of fish enhancement structures or instream modifications would result in long-term beneficial effects on fish. Short-term impacts on water quality would result from the disturbance of river bottom material during construction. Fish would return after temporarily being displaced.

Impacts of chemical use on noxious weeds on fish and water quality would be the same as discussed in Alternative 1.

The information and education program could indirectly result in beneficial effects to fish and water resources by creating user awareness and an understanding of the importance of resource protection.

**Alternative 3**

Impacts of managing campsites and day use areas in the riparian area on fish and water quality would be the same as discussed in Alternative 2.

Impacts of designating specific use trails on the east side of the river, and re-routing and rehabilitating existing trails in other areas would result in a beneficial effect on fish and water quality by reducing soil erosion and sediment load into the river. Non-point source pollution from barrier free asphalt trails would not impact fish or water quality. Short-term impacts would occur as a result of initial construction and rehabilitation.

Closing and rehabilitating roads not designated would result in the same impacts as discussed in Alternative 2.

Re-routing roads out of the riparian area and specifying trails for walk-in boat launching/landing would have beneficial effects to fish and water quality by reducing turbidity associated with soil erosion and eliminating pollution from vehicles that can no longer enter the river.

The year round minimum flow scenario of 75 cfs would result in long-term benefits to fish and water quality. In the long-term there would be an increase in fish habitat, fish communities, fitness, and survival would improve due to sustained flows during the winter. Just as in Alternative 2, there would be an unknown increase in survival in young fish. Managed flood releases of up to 3,000 cfs would flush sediment through the river which could reduce substrate problems. In turn, there would be an increase of space between substrate or rocks where aquatic insects would live and grow, increasing the food supply for fish.

The beneficial effects of water quality monitoring would be the same as discussed in Alternative 2.

Impacts of managing the riparian area to achieve proper functioning condition would be the same as discussed in Alternative 2.

Impacts of managing streambank enhancement projects on fish and water quality would be the same as discussed in Alternative 1.

Installing fish enhancement structures, instream modifications, and fish screens would result in the same impacts to fish and water quality as discussed in Alternative 2, except fish screens would facilitate an increase in natural biodiversity of fish communities and an increase in native fish stocks. Escapement of hatchery fingerlings into the river from Prineville Reservoir would be minimized.

Impacts of chemical use on noxious weeds on fish and water quality would be the same as discussed in Alternative 1.

The information and education program could indirectly result in more effective indirect protection of fish and water resources by creating more communication devices that aim to promote user awareness and an understanding of the importance of resource protection.

**Alternative 4**

Impacts of managing campsites and day use areas in the riparian area, and non-motorized use trails would be the same as discussed in Alternative 3.

Impacts of managing roads and parking areas would be the same as discussed under Alternative 3, except, surfacing all campground and day use network roads and campspurs with oil/gravel would result in non-point source pollution which could indirectly result in short-term impacts to water quality. Non-point source pollution from the highway is estimated to be a similar impact. Permanent designation of these areas would provide more effective long-term protection of adjacent soil and vegetation reducing possible turbidity in the river.

The year round minimum flow scenario of 75 cfs from July to January, 150 cfs for February and June, and 255 cfs from March to May would result in long-term benefits to fish and water quality. Impacts of this flow scenario would result in the same impacts to fish and water quality as discussed in Alternative 3, except continuous flush and flow releases would create long-term bank building which leads to increased riparian vegetation cover, improved water quality, and enhanced fish habitat.

The beneficial effects of water quality monitoring would be the same as discussed in Alternative 2.

Impacts of managing the riparian area to achieve proper functioning condition would be the same as discussed in Alternative 2.

Impacts of managing streambank enhancement projects on fish and water quality would be the same as discussed in Alternative 1.

Impacts of installing fish enhancement structures and instream modifications would result in the same impacts to fish and water quality as discussed in Alternative 2.

Discontinuing use of chemicals in riparian and upland areas would not create any impacts on fish and water quality.

Impacts to fish and water resources resulting from management of the information and education program would be the same as in Alternative 3.

**Alternative 5 (Draft Preferred)**

Impacts of managing campsites and day use areas in the riparian area, and non-motorized use trails would be the same as discussed in Alternative 3.

Impacts of managing roads and parking areas would be the same as discussed in Alternative 3.

Designating three boat launching/landing areas could result in the same impacts as discussed in Alternative 2.

Management of flow releases and flood control from Prineville Reservoir under the proposed flow scenario theme would have the same impacts to fish and water quality as discussed in Alternative 3. In addition, conducting an instream flow study would provide quantitative data to establish appropriate flows that protect and enhance fish and water quality in the long-term.

The beneficial effects of water quality monitoring would be the same as discussed in Alternative 2.

Impacts of managing the riparian area to achieve proper functioning condition would be the same as discussed in Alternative 2.

Impacts of managing streambank enhancement projects on fish and water quality would be the same as discussed in Alternative 1.

Impacts of installing fish enhancement structures and instream modifications would result in the same impacts to fish and water quality as discussed in Alternative 2.

Impacts of chemical use on noxious weeds on fish and water quality would be the same as discussed in Alternative 1.

Impacts to fish and water resources resulting from management of the information and education program would be the same as in Alternative 3.

## Impacts to Wildlife

Impacts to wildlife would result from management of roads and trails, camping and day use areas, vegetation, and instream resources. They are summarized in Table 11 and described below.

Management actions as described in the alternatives would result in changes in vegetative diversity and, therefore, wildlife habitat diversity.

### Alternative 1 (No Action)

Management of the 10 existing campgrounds and a variety of undefined day use areas would continue to impact wildlife due to disturbance, displacement, and habitat loss resulting from increases in uncontrolled recreation use throughout the corridor.

Allowing unrestricted non-motorized access within the corridor would result in impacts to soil and vegetation, in turn resulting in degradation of wildlife habitat and continuation of wildlife disturbance in unnecessary access areas.

Limiting motorized vehicles to designated roads is intended to reduce soil erosion and increase vegetative cover in previously impacted areas. The off-road vehicle closure is currently not resolving soil and vegetation problems, thereby, resulting in wildlife displacement and habitat loss.

Maintaining the riparian area in proper functioning ecological condition is dependent upon flows released from Prineville Reservoir. Management of flows under the current flow regime would result in long-term loss of vegetative diversity and in turn, reduce wildlife habitat diversity in the riparian area. Limited winter

**Table 11–Summary of Impacts to Wildlife**

| Managing: | Alt1 (NoAction) | Alt 2 | Alt 3 | Alt 4 | Alt 5 (Pref) |
|---|---|---|---|---|---|
| Campgrounds/Day Use Areas | -L | +L | +L | +L | +L |
| Trails/Use | -L | +L | +L | +L | +L |
| Roads/Vehicle Use | | | | | |
| Closures | -L | +L | +M | +M | +M |
| Upgrading | NC | NC | +L | +L | +L |
| Parking | NA | NA | +L | +L | +L |
| Instream Resources | -L | +L | +M | +M | +M |
| Vegetation | NC | +L | +L | -M | +L |
| Wildlife | NC | +L | +L | +M | +L |
| Overall | -L | +L | +L | +L | +L |

+ Beneficial
- Adverse
NC No Change
H High
M Medium
L Low
NA Not Applicable

flows increase the potential for winter freeze up which impacts the wintering waterfowl population by reducing open water for feeding. In turn, those raptors such as the Bald Eagle that feed on waterfowl could be displaced and relocate to other areas with more suitable habitat. Conducting an instream flow study would provide quantitative data to establish appropriate flows that would benefit riparian vegetation diversity and provide long-term beneficial effects for wildlife.

Currently, irregular flood control releases during high run-off periods that increase streamflows anywhere from 10 cfs to as much as 3,000 cfs result in impacts to wildlife in the form of habitat loss and nesting waterfowl displacement.

Maintaining ecological condition between mid and late seral in the upland areas with strategies such as prescribed fire and juniper thinning, would result in long-term enhancement of vegetative and wildlife habitat diversity. Wildlife species dependent on late seral plant communities for the majority of their life cycle may be impacted in the short-term as a result of habitat displacement after prescribed burning. Wildlife that depend on low seral ecological conditions would benefit in the short-term. These conditions could last as long as 10 years or until pre-fire conditions are regained.

Mosaic juniper thinning strategies would result in a decrease in juniper dominated plant communities with a conversion to a shrub and grass community. A mosaic thinning pattern would provide a large amount of edge, thereby, increasing habitat richness. In the long-term this community would indirectly stabilize soils and increase habitat for wildlife.

Use of chemicals in the upland areas would result in increased benefits to vegetation communities that wildlife depend upon for habitat. However, there could be an unquantifiable rate of mortality of wildlife resulting from chemical use.

**Alternative 2**

Designating eight campgrounds and two day use areas would confine existing and future increases in recreation use to specific areas lessening potential impacts to adjacent wildlife areas that are created by human presence. Campsites that impact sensitive wildlife would be evaluated and closed if necessary until determined that impacts to wildlife no longer exist.

Excluding camping and encouraging use of existing user developed trails on the west side of the river would have long-term beneficial effects on wildlife due to reduced human presence and minimal vegetative impact of wildlife habitat.

Limiting use of bikes and horses to roads and trail on the east side of the river would confine use to these specific areas resulting in long-term beneficial effects to wildlife.

Limiting motorized vehicles to designated roads and parking areas, and re-routing, closing, and rehabilitating roads and trails experiencing heavy degradation would minimize impacts to vegetation and allow native vegetation to re-establish in formerly overused areas, therefore, allowing specific wildlife habitat requirements of food and cover to be maximized.

Designating three boat launching/landing areas would result in confined trampling and limited bank erosion and vegetation loss resulting in degradation to wildlife habitat in and around these areas. Confining launching/landing to specific sites would help reduce these impacts in other areas.

Impacts to wildlife resulting from management of flow releases under the proposed flow scenario theme would be the same as in Alternative 1, except encouraging natural bank stabilization methods would result in vegetative recovery in the riparian area and enhance wildlife habitat diversity.

Impacts to wildlife as a result of flood control management would be the same as discussed in Alternative 1.

Installation of fish enhancement structures would result in long-term benefits to wildlife by indirectly providing additional habitat for aquatic invertebrates and fish which are a major food resource for waterfowl and furbearers. These structures would also provide resting/loafing areas for wildlife using the Crooked River system.

Impacts to wildlife resulting from management of vegetation would be the same as in Alternative 1.

Management of threatened, endangered and sensitive wildlife species (if present) would improve through inventory and monitoring efforts. Additional information from data collection would provide insight in terms of long-term species management.

Additional restrictions on the discharge of firearms and hunting except during official waterfowl, big game, and upland game seasons would result in beneficial effects on wildlife by minimizing the period that they are harassed and displaced.

Erecting and maintaining artificial structures such as perching and nesting platforms and/or boxes would supplement natural nesting places

and enhance bird habitat, particularly, cavity nesting birds.

Impacts to wildlife resulting from chemical management in the upland areas would be the same as in Alternative 1.

The information and education program would indirectly result in beneficial effects to wildlife by creating user awareness and an understanding of the importance of wildlife habitat protection.

**Alternative 3**

Impacts of managing the proposed campgrounds and day use areas would be the same as discussed in Alternative 2.

Excluding camping and encouraging use of existing user developed trails on the west side of the river would have the same impacts as discussed in Alternative 2.

Impacts of designating specific use trails on the east side of the river, and re-routing and rehabilitating existing trails in other areas would result in the same impacts as discussed in Alternative 2. However, constructing a 4.5 mile hiking trail in the upland area extending along the rim between Chimney Rock and the Quarry could impact seasonal cliff dwelling wildlife as a result of increased human presence. If determined necessary, the trail would be closed until it was determined that impacts to wildlife no longer exist. Limiting use of bikes to roads and horses to roads and trails on the east side of the river would confine use to these specific areas minimizing impacts to vegetation resulting in long-term beneficial effects to wildlife habitat.

Limiting motorized vehicles to designated roads and parking areas, and re-routing, closing, and rehabilitating roads would result in the same impacts as discussed in Alternative 2, except re-routing roads out of the riparian area and specifying trails for walk-in boat launching/landing would benefit wildlife by minimizing impacts to riparian vegetation and allow recovery of the riparian area which is a key component in wildlife habitat.

Impacts to wildlife resulting from management of flow releases under the proposed flow scenario theme would result in long-term benefits to wildlife by providing additional water surface area and aquatic habitat for use seasonally by waterfowl. Additional benefits would result in the riparian area with increased water table and supporting a much larger structured vegetative community, thereby, increasing wildlife and fish diversity.

If designed to approximate natural flooding events, increased flows of short duration up to 3,000 cfs would enhance wildlife habitat in the riparian area. Wildlife would benefit in the long-term if irregular flooding events were coordinated around spawning and waterfowl nesting periods to ensure that fish and wildlife are not impacted.

Impacts to wildlife by installing fish enhancement structures would be the same as discussed in Alternative 2.

Impacts to wildlife resulting from vegetation management would be the same as in Alternative 2, except planting and seeding only native vegetation would provide the habitat components necessary for the areas native wildlife species. In areas where juniper dominates the vegetative community, restricting juniper thinnings would impact wildlife by reducing perennial grasses and forbs in the uplands.

Impacts to wildlife by providing additional restrictions on the discharge of firearms and hunting except during official waterfowl, big game, and upland game seasons would be the same as discussed in Alternative 2.

**Table 12–Summary of Impacts to Cultural Resources**

| Managing: | Alt1 (NoAction) | Alt 2 | Alt 3 | Alt 4 | Alt 5 (Pref) |
|---|---|---|---|---|---|
| Recreation Use: (Access, Type of Activity, etc.) | -L | +L | +L | -L | +L |
| Soil Disturbing Activities (Facility Development, Vegetation Management, etc.) | NC | +L | +L | -L | +L |
| Public Information/Education | -L | +L | +M | +M | +M |

+ Beneficial
- Adverse
NC No Change
H High
M Medium
L Low
NA Not Applicable

Impacts to wildlife resulting from chemical management would be the same as in Alternative 1.

The information and education program would indirectly result in more effective protection of wildlife resources by creating more communication devices that aim to promote user awareness and an understanding of the importance of wildlife habitat protection.

**Alternative 4**

Impacts of managing the proposed campgrounds and day use areas would be the same as discussed in Alternative 2.

Impacts of managing, motorized vehicles, roads and non-motorized use trails would result in the same impacts as discussed in Alternative 3.

Impacts to wildlife resulting from management of flow releases under the proposed flow scenario theme would result in the same impacts as discussed in Alternative 3, except continuous flush and flow releases would provide long-term benefits for wildlife by supporting an increase in wildlife diversity and species richness through an increase in riparian vegetative cover, improved water quality, and enhanced fish habitat.

Impacts to wildlife by installing fish enhancement structures would be the same as discussed in Alternative 2.

Impacts to wildlife resulting from vegetation management would be the same as in Alternative 3, except wildlife would be impacted in the long-term due to declining wildlife habitat diversity as a result of movement towards a late seral/climax condition up until prescribed burning occurs. Species richness would not be maximized. Wildlife habitat would again be impacted in the short-term as a result of habitat displacement after prescribed burning. Wildlife diversity would benefit at ecological status cycles back to mid to late seral conditions.

Impacts to wildlife by prohibiting discharge of firearms, hunting, and trapping in the river corridor would result in beneficial effects on wildlife by eliminating wildlife harassment and displacement created by this form of activity

and reducing mortality of wildlife in the river corridor.

Discontinuing use of chemicals in the upland areas would not create any impacts on wildlife. Impacts to wildlife resulting from management of the information and education program would be the same as in Alternative 3.

**Alternative 5 (Draft Preferred)**

Impacts of managing the proposed campgrounds and day use areas would be the same as discussed in Alternative 2.

Excluding camping and encouraging use of existing user developed trails on the west side of the river would have the same impacts as discussed in Alternative 2.

Impacts of managing motorized vehicles, roads, and non-motorized use trails would result in the same impacts as discussed in Alternative 3.

Impacts to wildlife resulting from management of flow releases and flood control from Prineville Reservoir under the proposed flow scenario theme would result in the same impacts as discussed in Alternative 3.

Impacts to wildlife by installing fish enhancement structures would be the same as discussed in Alternative 2.

Impacts to wildlife resulting from management of vegetation and wildlife would be the same as in Alternative 2.

Impacts to wildlife by providing additional restrictions on the discharge of firearms and hunting except during official waterfowl, big game, and upland game seasons would be the same as discussed in Alternative 2.

Discontinuing use of chemicals in the upland areas would not create any impacts on wildlife.

Impacts to wildlife resulting from management of the information and education program would be the same as in Alternative 3.

## Impacts to Cultural Resources

Impacts to cultural resources could result from management of recreation use, public information and education, and soil disturbing activities. They are summarized in Table 12 and described below.

Activities that disturb soils have the most potential to disrupt below-the-surface cultural resources. These activities would take place under all alternatives with the most below-the-surface soil disturbance occurring under Alternative 4. As a mitigating measure, a cultural resource survey or assessment would be required before any ground-disturbing activities could actually begin. If a site was discovered, the activity would have to be relocated, or if not feasible, the site would be evaluated and excavated to recover all significant cultural resource data. Information from these sites would result in beneficial effects by providing an increased knowledge of prehistoric and historic utilization of the Lower Crooked River corridor.

Impacts to cultural resources resulting from recreation use could occur under all alternatives. All alternatives except Alternative 1, encourage recreation use in existing use areas or previously disturbed areas providing long-term protection to known and unknown sites not experiencing any previous disturbance. Limiting bikes to the east side of the river as described in Alternatives 2, 3, 4, and 5 would provide long-term protection of cultural resources on the west side of the river. Alternative 4 would result in the greatest potential disturbance of cultural sites by expanding trail networks and walk-in camping on the west side of the river. Continuing present use patterns under Alternative 1 would cause continued

decline in condition of cultural resources subject to trampling, breakage, and vandalism.

With greater emphasis in Alternatives 3, 4, and 5, the public information and education program would utilize a variety of interpretive devices that would result in long-term reinforcement of desired attitudes about and behavior toward cultural resources. Under all alternatives the program is designed to reduce impacts to cultural resources.

## Impacts to Soil and Vegetation

Impacts to vegetation would result from construction, maintenance, and/or management of roads and trails, camping and day use areas, vegetation, and instream resources. They are summarized in Table 13 and described below.

Management actions as described in the alternatives result primarily in changes in vegetative cover and diversity as well as in soil's physical, chemical and biological properties.

### Alternative 1 (No Action)

Occasional rehabilitation of degraded sites in ten existing campgrounds and a variety of undefined day use areas would have a short-term beneficial effect by reducing soil erosion and allowing site specific vegetative cover to recover. Uncontrolled recreation use in undes-

**Table 13–Summary of Impacts to Soil and Vegetation**

| Managing: | Alt1 (NoAction) | Alt 2 | Alt 3 | Alt 4 | Alt 5 (Pref) |
|---|---|---|---|---|---|
| Campgrounds/Day Use Areas | -L | +L | +M | +M | +M |
| Facilities | -L | +L | +M | +M | +M |
| Trails/Use | -L | +L | +M | +M | +M |
| Roads/Vehicle Use | | | | | |
| Closures | -L | +L | +M | +M | +M |
| Upgrading | NC | +L | +M | +M | +L |
| Parking | -L | +L | +M | +M | +M |
| Instream Resources | -L | NC | +M | +M | +M |
| Vegetation | NC | +L | -L* | -L* | -L* |
| Overall | -L | +L | +M | +M | +M |

Note: Some management actions above may disturb vegetation in the short-term but not significantly.
* Soils would experience beneficial effects (+L).

| | | | | | |
|---|---|---|---|---|---|
| + | Beneficial | H | High | NA | Not Applicable |
| - | Adverse | M | Medium | | |
| NC | No Change | L | Low | | |

ignated areas would continue to cause soil compaction and a loss of vegetative cover in a number of unnecessary use sites.

Existing facilities in the corridor confine heavy use to specific areas resulting in vegetative loss, compacted soils, and dust. Soils and vegetation in other areas would benefit indirectly in the long-term.

By allowing unrestricted non-motorized access within the corridor, loss of vegetative cover, soil erosion, and soil compaction would continue.

Upgrading roads experiencing heavy degradation and limiting motorized vehicles to designated roads would reduce erosion and increase vegetative cover in previously impacted areas.

Occasional stabilization of campground entrance road aprons and highway parking and pullout areas would reduce soil erosion.

Maintaining the riparian area in proper functioning ecological condition is dependent upon flows released from Prineville Reservoir. Conducting an instream flow study would provide quantitative data to establish appropriate flows that would directly benefit riparian areas in the long-term through soil deposition, bank building, and an increase in vegetation diversity. Management of vegetation and wildlife habitat by maintaining the ecological condition between mid and late seral in the upland areas with strategies such as prescribed fire and juniper thinning, would result in long-term enhancement of vegetative cover and soil stability. Soils and vegetation could be impacted in the short-term as a result of cut trees and wind and soil erosion that would follow prescribed burning. These soil conditions could last as long as 10 years or until pre-fire conditions are regained.

Mosaic juniper thinning strategies would result in a decrease in juniper dominated plant communities with a conversion to a shrub and grass community. In the long-term this community would indirectly stabilize soils. A loss of vegetation would occur in the short-term as a result of trampling during juniper thinning.

Upland vegetation communities would continue to benefit from the use of chemicals for protection against intrusion of noxious weeds and for use in other vegetation enhancement projects. Soil biology could be impacted in the short-term.

**Alternative 2**

By designating use sites and hardening facilities in eight campgrounds and two day use areas, soil erosion, compaction, and vegetative loss would be limited to specific areas. These areas would be monitored and stabilized using basic site protection measures as needed to reduce impacts to soils and vegetation resulting from trampling. Vegetative cover in adjacent areas would indirectly benefit as a result of defined use areas.

Excluding camping and encouraging use of existing user developed trails on the west side of the river would protect soil stability and improve vegetative vigor in adjacent areas. Trampling of vegetation would be dispersed along the banks from fishing and boat access.

Limiting use of bikes and horses on the east side of the river to roads and trails would result in short-term soil erosion and vegetation loss associated with trampling in these areas. With occasional maintenance, some of these areas would revegetate naturally. Vegetative cover in restricted areas would improve as a result of defined use on roads and trails. Re-routing and stabilizing existing non-motorized use trails on the east side of the river experiencing heavy degradation would help decrease soil erosion and increase revegetation. Short-term impacts

*Typical soil erosion and vegetative loss created by undefined use*

would result from soil disturbance during construction.

Limiting motorized vehicles to designated roads, and closing and rehabilitating undesignated roads would result in increased vegetative cover in previously impacted areas, benefiting soil stability and decreasing erosion and turbidity of the river.

Stabilizing and applying gravel to campground entrance road aprons and highway parking and pullout areas would protect soils from accelerated erosion problems related to constant use. Short-term impacts would occur as a result of soil disturbance during construction.

Designating three boat launching/landing areas would result in short-term impacts created by soil disturbance during construction. Soil stability, riparian vegetation, and residual ground cover in adjacent areas would increase through restrictions on vehicle access to the river.

Impacts to soils and vegetation resulting from management of flow releases under the proposed flow scenario theme would be the same as in Alternative 1. Encouraging natural bank stabilization methods could result in beneficial effects to soils and vegetative cover in the riparian area.

Impacts to soils and vegetation resulting from management of vegetation and wildlife habitat would be the same as in Alternative 1, except the ability to seed and plant native and non-native vegetation could expedite soil stability

and vegetative cover. Threatened, endangered and sensitive plant species (if present) would be enhanced through inventory and monitoring efforts which would enable proactive management.

Impacts to soils and vegetation resulting from use of chemicals on noxious weeds in upland areas would be the same as in Alternative 1.

The information and education program could indirectly result in beneficial effects to soil stability and vegetation by creating user awareness and an understanding of the importance of resource protection.

**Alternative 3**

The impact of managing ten campgrounds, five day use areas, and facilities would be the same as discussed in Alternative 2, except major site protection measures such as installation of vehicle barriers and designation of campspurs would result in more effective long-term protection of adjacent soils and vegetation in and adjacent to use areas.

Excluding camping and encouraging use of existing user developed trails on the west side of the river would result in the same impacts to soils and vegetation as discussed in Alternative 2.

Designating non-motorized use trails on the east side of the river in the riparian and upland areas and constructing 4.5 miles of new hiking trail east of Highway 27 would result in short-term soil disturbance and vegetation loss during construction and long-term soil compaction of the trail tread. These impacts would be confined to the trails thus benefiting soil stability and vegetative cover in adjacent areas in the long-term.

Impacts to soils and vegetation by limiting use of horses on the east side of the river to roads and trails would be the same as those discussed in Alternative 2.

Limiting vehicles and mountain bikes to designated roads, and closing and rehabilitating undesignated roads would result in increased vegetative cover in previously impacted areas, benefiting soil stability, and decreasing erosion and sedimentation. Closure of unnecessary roads would have the same effects as discussed in Alternative 2.

Stabilizing and applying asphalt to campground entrance road aprons, specific highway parking and pullout areas, and specified physically challenged access trails would result in long-term soil stability and improved vegetative vigor in adjacent areas. Minor short-term impacts would occur as a result of soil disturbance during construction. Non-point source pollution from the asphalt would not significantly impact the immediate or surrounding soils or vegetation.

Surfacing campground and day use area road networks and campspurs with gravel would result in more effective protection of soils from the effects of erosion. Short-term impacts to soil and vegetation would result during initial construction.

Re-routing roads out of the riparian area and specifying trails for walk-in boat launching would enhance soil stability, riparian vegetation, and residual ground cover.

Impacts to soils and vegetation resulting from management of flow releases under the proposed flow scenario theme would allow occasional flood releases that resemble natural flooding to expedite bank stabilization and natural plant succession. Short-term impacts could occur and result in bank erosion if flows were allowed to continue for long periods of time. All other effects on soils and vegetation

within the riparian area would be the same as discussed in Alternative 2.

Impacts to soils and vegetation resulting from management of vegetation and wildlife habitat would be the same as in Alternative 2, except juniper would continue to dominate some sites resulting in a decrease in perennial grasses and forbs, as well as an increase in soil erosion in the long-term.

Impacts to soils and vegetation resulting from use of chemicals on noxious weeds in upland areas would be the same as discussed in Alternative 1.

The information and education program could indirectly result in more effective indirect protection of soils and vegetation by creating more communication devices that aim to promote use awareness and an understanding of the importance of resource protection.

**Alternative 4**

The impact of managing campgrounds, day use areas, and facilities would be the same as discussed in Alternative 3, except enlarging use areas and allowing walk-in camping across from Chimney Rock would result in short-term impacts to soils and vegetation during construction. Limited soil erosion, compaction, and vegetative loss would occur in these newly designated areas in the long-term.

Designating non-motorized use trails on the east side of the river in the riparian and upland areas and constructing approximately 4.5 miles of new hiking trail east of Highway 27 and a 7 mile loop trail on the west side across from Chimney Rock would result in short-term soil disturbance and vegetation loss during construction and long-term soil compaction of the trail tread. These impacts would be confined to the trails thus benefiting soil stability and vegetative cover in adjacent areas in the long-term.

Impacts to soils and vegetation by limiting use of horses to Highway 27 would improve soil stability and increase vegetative vigor in previously impacted use areas.

Impacts of managing motorized vehicles, bikes, roads, and parking areas would be the same as discussed under Alternative 3, except, surfacing all campground and day use network roads and campspurs with oil/gravel would result in minor non-point source pollution which could indirectly change soil biology and reduced vegetation in directly adjacent roadside areas. Non-point source pollution from the highway is estimated to be a similar impact. Permanent designation of these areas would provide more effective long-term protection of vegetation away from roadside areas.

Impacts to soils and vegetation resulting from management of flow releases under the proposed flow scenario theme would be the same as discussed under Alternative 3.

Impacts to soils and vegetation resulting from management of vegetation and wildlife habitat would be the same as in Alternative 3, except long-term impacts such as a loss of vegetative cover with soil erosion could occur if juniper growth was unimpeded until it completely dominates the area. Except during regrowth, the corridor would realize long-term beneficial effects after prescribed burning promotes conversion of the juniper community back into a shrub and grass community.

Discontinuing use of chemicals in the upland areas would not create any impacts on soils or vegetation.

Impacts to soils and vegetation resulting from management of the information and education

program would be the same as discussed in Alternative 3.

**Alternative 5 (Draft Preferred)**

By designating use sites and hardening facilities in nine campgrounds and five day use areas, soil compaction and vegetative loss would be limited to specific areas. Impacts to soils and vegetation would be the same as discussed in Alternative 2.

Excluding camping and encouraging use of existing user developed trails on the west side of the river would have the same impacts to soil and vegetation as discussed in Alternative 2.

Management of non-motorized use trails on the east side of the river in riparian and upland areas and constructing 4.5 miles of new hiking trail would have the same impacts to soils and vegetation as discussed in Alternative 3.

Impacts of limiting use of horses on the east side of the river to roads and trails would have the same impacts to soils and vegetation as discussed in Alternative 2.

Limiting vehicles and bikes to designated roads, closing and rehabilitating undesignated motor vehicle routes, and prohibiting vehicle access into the river, except at boat launching/landing areas, would have the same impacts to soils and vegetation as discussed under Alternative 3.

Surfacing campground and day use area road networks and campspurs with gravel would have the same impacts to soils and vegetation as discussed in Alternative 3.
Re-routing roads out of the riparian area, except for three designated boat launching/landing would have the same impacts to soils and vegetation as discussed in Alternative 2.

Management of flow releases from Prineville Reservoir under the proposed flow scenario theme would have the same impacts to soils and vegetation as discussed in Alternatives 3. Conducting an instream flow study would provide quantitative data to establish appropriate flows that indirectly support vegetation diversity and facilitate bank building.

Management of vegetation and wildlife habitat would result the same impacts to soils and vegetation as discussed in Alternative 2.

Mosaic juniper thinning strategies would result in the same impacts as discussed in Alternatives 1 and 2.

Use of chemicals in upland areas for use on noxious weeds would result in the same impacts as discussed in Alternative 1.

The information and education program would result in the same beneficial impacts as discussed in Alternative 3.

## Impacts to Air

Impacts to air quality could result from prescribed fires or conditional fire suppression, wildfire, and/or mechanical treatment of vegetation and dust from exposed or disturbed soils.

Prompt detection and suppression of wildfires under all alternatives would have a beneficial effect on air quality.

Under all alternatives, temporary localized increases in suspended particulates resulting from prescribed burning and/or conditional fire suppression would result in short-term impacts to air quality. Short-term impacts to air quality would also result from dust created by mechanical treatment of vegetation.

Except under Alternative 1, there would be no impacts to air quality resulting from increased recreation use. Under Alternative 1, short-term impacts would result from dust created by undefined camping areas and vehicle use.

### Impacts to Socioeconomics

Impacts to socioeconomics would primarily result from increases and changes in recreational activity and changing flow releases from Prineville Reservoir.

Year round recreation opportunities along the Lower Crooked River help support a stable local tourism economy in Prineville, Oregon. Management actions in alternatives 3, 4, and 5 could further stimulate this economy as a result of more developed visitor experience in the river corridor and increasing trends in use. Potential increases in recreational activity could attract new tourism related businesses. Increased activity also might result in some increases in related employment. As a result, some new sales tax revenues would be generated by increased recreational activity and purchasing in the area. No overall increases in income levels are likely to result from any of the alternatives.

Potential increases in recreational activity may put stress on emergency, law enforcement, and road maintenance services. Funding and cooperative agreements would help to mitigate the effects of potential increased recreational use.

Because the river corridor is almost entirely in public ownership, property tax levels would not be effected.

Management of minimum flow releases as described in Alternatives 1, 2, and 5 would have no effect on the current economic situation. Minimum flow releases discussed in Alternatives 3 and 4 could impact irrigation users by reducing the total availability of water for irrigation purposes.

### Impacts resulting from Management Actions Common to All Alternatives

Some management actions have already been taken, or are in the process of being implemented by one or more of the managing agencies as a result of previous planning decisions or interagency agreements. Other actions believed to lack public controversy or which do not significantly impact the environment are described as "Management Actions Common to All Alternatives." These management actions would primarily result in beneficial effects to resources within the river corridor. The impacts to many of these actions have be analyzed by the Brothers/Lapine Resource Management Plan and Environmental Impact Statement. Those actions not discussed in other documents that could result in adverse impacts are briefly discussed below.

1. Managing for Roaded Natural experiences between the east side of the river and the east side of Highway 27, including the Quarry Area, would result in long-term beneficial effects on scenic quality by limiting development of roads, trails, campgrounds, and day use areas to levels subordinate to the surrounding landscape.

2. Managing for Semi-Primitive Non-Motorized experiences on the west side of the river and east of Highway 27, except in the Quarry Area would result in long-term beneficial effects on scenic quality by restricting development of roads, campgrounds and day use areas.

3. Allowing dead and/or down vegetation to remain in place would encourage nutrient cycling and promote healthy plant communities.

4. Allowing llamas in human use areas would present no long-term impact on physical resources. However, some recreation users may be effected by the presence of the animal in use areas resulting in conflicts among users. Surveys indicate that use of llamas in the corridor is fairly minimal.

5. The infrequent use of short-term spot grazing as a management tool to achieve resource objectives such as controlling noxious weeds would result in improvement of vegetative resources.

6. Short-term impacts on air quality would result from dust created from surface material movement in the quarry area. Use of the quarry is limited and of short duration.

7. By using the techniques of landscape ecology concepts and existing scenic resource planning and analysis tools, all management activities would be designed to blend with the natural terrain to avoid contrast with character of the surrounding landscape. Potential contrasts from site developments would be partially mitigated through the use of professional landscape design skills, native or natural-appearing materials, and vegetative screens. In all alternatives, rehabilitation efforts would minimize impacts to scenic quality by minimizing disturbance. The Visual Resource Management study's Scenic Quality Rating Unit classifications would act as indicators to ensure scenic resources are not impacted in the long-term.

8. Allowing for future maintenance or reconstruction of Bowman Dam could impact river related resources in the short-term as described in the Bowman Dam Environmental Assessment. All activities within the wild and scenic river boundary would be evaluated on a case-by-case basis to ensure protection of outstandingly remarkable values.

## Irreversible or Irretrievable Commitment of Resources

Areas committed to facilities and roads constitute an irretrievable loss of vegetative production. Land committed to major roads and facilities could be considered to be an irreversible effect.

Continued availability of mineral resources such as gravel has both irretrievable and irreversible effects.

## Short-Term Use and Long-Term Productivity

The most significant activity proposed by the alternatives is the continued management of vegetation for wildlife habitat as well as the continued management of recreation. The short-term effects increase the long-term productivity as existing conditions are altered to enhance the long-term conditions. Short-term use of soils for roads and use sites which compact soil will reduce the long-term productivity on a site specific basis. This would occur in highly defined areas in only a small portion of the river corridor.

## Probable Adverse Environmental Impacts that Cannot be Avoided

Soil would be displaced as a result of construction of approximately four miles of road, ten miles of trails, and associated recreation facilities. Overall, soil productivity would be maintained except for sites dedicated to roads, recreation sites, and other facilities which compact the soil or occupy a site.

Air quality may be temporarily degraded in localized areas as a result of prescribed fires.

Short-term degradation of visual quality in recreation and visual areas would occur as a result of recreation site and trail construction until vegetation covers the disturbed areas.

## Cumulative Impacts

Regulations implementing National Environmental Policy Act define cumulative impacts as:

The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

For this project, the issue is whether any of the management plan directions contain measures which could contribute to cumulative impacts, which could be either adverse or beneficial. The following is a discussion of the most likely cumulative impacts that are relevant to the key issues addressed in this environmental assessment.

1. The beneficial effects to fish, wildlife, riparian, and other river related resources by using results from an instream flow study in cooperation with other agency requirements to determine appropriate minimum instream flows would add incrementally to the Crooked River basin planning effort. All river related resources would benefit in the long-term.
2. The beneficial effects of using fire management and other vegetation management strategies would provide one link in many that support a productive watershed ecology within the Crooked River basin.
3. Cumulative effects on landscape character are the aggregate changes to the existing landscape, both inside and outside the designated boundaries, which are likely to occur as a result of actions which cause change. Actions which have the potential to cause change can either be a result of this proposal or they can be generated by forces outside of the control of this proposal. Given the proposed management actions, landscape characteristics are expected to remain natural in appearance. However, uncontrolled wildfire and excessive flood control during high precipitation periods could alter this expected cumulative outcome.
4. It is expected that management actions that provide for beneficial effects to recreation experience would make the area more desirable for recreation use. This, along with increasing trends in recreation use will likely increase pressures on the resources while providing increased tourism for local economies.

# V. Implementation

## A. Roles and Interagency Relationships

Once adopted, the Lower Crooked River Management Plan will embody Alternative 5 (Preferred) and Management Actions Common to All Alternatives as discussed in Chapter 2. The Lower Crooked River Management Plan will then trigger amendments to the Brothers/LaPine Resource Management Plan (RMP) and the Prineville Reservoir RMP. These RMP's currently provide direction for all resource management programs, practices, uses, and protection measures on lands managed by the Bureau of Land Management and Bureau of Reclamation in the general vicinity of the river corridor. Since the Brothers/LaPine RMP is already in effect, it will be amended to incorporate the River Management Plan. The River Management Plan will also be incorporated into the Bureau of Reclamation's Prineville Reservoir RMP which is scheduled for completion in 1993.

Successful implementation of the Lower Crooked River Management Plan will require close coordination and cooperation between numerous federal, state, and local government agencies. The primary roles and responsibilities of these management partners are outlined in Chapter 1. Specific roles and responsibilities of the joint management partners beyond those outlined in Chapter 1 are discussed below.

### *Bureau of Land Management Responsibilities:*

#### Recreation Management

Implement plans, maintain, and manage recreation use facilities on public lands within the river corridor, including: camping and day use areas, roads, trails, parking areas, launch/landing sites, signs, and other information/education facilities.

Jointly manage the Big Bend area with the BOR through a memorandum of understanding that dictates how construction, maintenance, and management will take place.

Implement a fire closure between June 1 and October 15 on all public lands within the river corridor.

Encourage ODFW to change regulations to limit discharge of firearms and hunting to official state Waterfowl, Big Game, and Upland Game seasons.

Establish a supplementary rule (43 CFR, PART 8360) to prohibit discharge of firearms within the wild and scenic river corridor boundaries except during official waterfowl, big game, and upland game hunting seasons.

Coordinate all elements of the information and education program within the river corridor.

Facilitate partnerships that promote land stewardship and enhance the Back Country Byway program.

Administer camping fee collection program as well as the commercial special recreation permit system for the river corridor.

Increase law enforcement coordination with Crook County.

Jointly monitor recreation use levels and high impact recreation opportunities with BOR and ODFW.

Coordinate with ODOT to redesign and harden all campground and day use entrance road aprons within the Highway right-of-way and identify specific high use parking and pullout areas along the Highway.

**Resource Protection**

Act as the lead agency and primary public contact for administration of public lands within the wild and scenic river corridor. The BLM does not have authority to regulate what happens on private land within and outside of the wild and scenic river corridor boundary.

Jointly manage riparian and upland resources within the Withdrawn Zone with the BOR through a memorandum of understanding that dictates specific roles and responsibilities for each agency.

Coordinate with BOR, ODFW and U.S. Fish and Wildlife to conduct vegetative management strategies, fish and wildlife habitat projects, and related monitoring studies.

Seek technical assistance from ODFW and the U.S. Fish and Wildlife Service regarding implication of proposed management actions on candidate or listed threatened or endangered species.

Coordinate efforts with BOR, ODFW, Ochoco Irrigation District, and other interested parties to conduct an Instream Flow Study that will later be used as a tool to recommend minimum flows necessary to protect outstandingly remarkable values.

Continue lead fire suppression responsibilities and coordinate all fire suppression activities within the river corridor.

Conduct cultural resources surveys, increase surveillance, and stabilize known, existing cultural sites on BLM land as needed.

***Bureau of Reclamation Responsibilities:***

**Recreation Management**

Jointly manage the Big Bend area with the BLM through a memorandum of understanding that dictates how construction, maintenance, and management will take place.

Jointly monitor recreation use levels and high impact recreation opportunities with BLM and ODFW.

Coordinate with BLM to establish a supplementary rule (43 CFR, PART 8360) to prohibit discharge of firearms within the wild and scenic river corridor boundaries except during official waterfowl, big game, and upland game hunting seasons.

**Resource Protection**

Jointly manage riparian and upland resources within the Withdrawn Zone with the BLM through a memorandum of understanding that dictates specific roles and responsibilities for each agency.

Coordinate with BLM, ODFW, and U.S. Fish and Wildlife to conduct vegetative management strategies, fish and wildlife habitat projects, and related monitoring studies.

Seek technical assistance from ODFW and the U.S. Fish and Wildlife Service regarding implication of proposed management actions on candidate or listed threatened or endangered species.

Coordinate efforts with BLM, ODFW, Ochoco Irrigation District, and other interested parties to conduct an Instream Flow Study that will later be used as a tool to recommend minimum flows necessary to protect outstandingly remarkable values.

Act as lead agency in coordinating efforts to resolve Prineville Reservoir storage reallocation and related flow management issues.

Conduct cultural resources surveys, increase surveillance, and stabilize known, existing cultural sites on BOR lands within the Withdrawn Zone as needed.

## B. Cost Estimates

Management actions proposed under each alternative have been combined into four main categories for budgeting purposes. The four categories include: 1) Area/Facility Development, 2) Annual Operation and Maintenance, 3) Annual Program Management, and 4) Monitoring Equipment. The management intent is to implement these actions as soon as the necessary funding can be secured through the agency's budgeting process. Estimated cost figures are derived from both BLM and BOR funding requirements and are based on fiscal year 1992 dollar values. Refer to Table 14 for estimated cost breakdown by alternative.

## C. Monitoring Plan

The monitoring prescribed in this plan is in addition to the monitoring standards established in the Brothers/LaPine Resource Management Plan and Prineville Reservoir Resource Management Plan. It expands these RMP's to address resource specific issues of the Lower Crooked River Management Plan.

The monitoring and evaluation of this plan will be based, whenever possible, upon the Limits of Acceptable Change concept (LAC). LAC is based on the premise that change to the ecological and social conditions of an area will occur as a result of natural and human factors. The goal of management is to keep the character and rate of change due to human factors within acceptable levels that are consistent with plan objectives and protection of the river's outstandingly remarkable values.

The primary emphasis of the LAC system is on the desired resource condition, rather than on how much use or abuse an area can tolerate. The management challenge is not one of how to prevent any human-induced change in the planning area, but rather one of deciding what changes should occur, how much change will be allowed, what management actions are needed to guide and control it, and how managers will know when the established limits are being or have been reached.

Once in place and functioning, the mechanics of the LAC system can alert the managing agencies to unacceptable change in the river corridor before it is too late to react. For each river value to be monitored, one or more key indicators are selected which allow managers to keep attuned to changes in the ecosystem or social setting. For each key indicator, a standard is set. This is the threshold value which determines the amount of change that is either desired or will be accepted. The purpose of the indicators and standards is to provide managers with a tool to determine if the resource values and opportunities they are managing for are actually being provided. The standards serve as "triggers" which cause predetermined management actions to be implemented when the limit is being approached.

The LAC process is designed to be the foundation for the long-term protection and enhancement of the primary river-related values in the river corridor. The process must, however, be flexible enough to allow for unique site-specific situation, and to provide ample opportunity for public involvement and adjustment as our resource and social knowledge base increase.

The following section outlines the key indicators, management standards, and monitoring that will be conducted on the Lower Crooked Wild and Scenic River corridor.

## Table 14 - Estimated Cost

| Area/Facility Development [1] | Alt. 1 | Alt. 2 | Alt. 3 | Alt. 4 | Alt. 5 |
|---|---|---|---|---|---|
| Castle Rock | 2,500 | 8,000 | 17,500 | 20,000 | 9,500 |
| Stillwater | 3,000 | 9,500 | 24,500 | 27,000 | 24,500 |
| Greenwood | 3,000 | 6,000 | 9,000 | 22,000 | 6,000 |
| Lone Pine | 3,500 | 12,000 | 20,000 | 33,500 | 20,000 |
| Lower Palisades | 6,500 | 13,000 | 35,000 | 44,500 | 35,000 |
| Chimney Rock | 2,500 | 10,000 | 21,500 | 47,000 | 21,500 |
| Cobble Rock | 3,000 | 5,500 | 13,500 | 30,000 | 13,500 |
| Post Pile | 2,500 | 5,500 | 12,000 | 33,500 | 12,000 |
| Poison Butte | 2,000 | 5,500 | 10,500 | 31,000 | 10,500 |
| Big Bend | 1,500 | 27,000 | 47,000 | 80,000 | 47,000 |
| Upper Lone Pine | - | - | 2,500 | 5,500 | 2,500 |
| Quarry Area | - | - | 2,500 | 12,000 | 1,000 |
| Upper Palisades | - | - | 4,000 | 15,000 | 12,000 |
| Rim Trailhead | - | - | 4,000 | 10,500 | 6,000 |
| Upper Poison Butte | - | - | 5,500 | 12,000 | 5,500 |
| Signing | 6,000 | 11,000 | 20,000 | 20,000 | 18,000 |
| Interpretive Devices | 10,000 | 25,000 | 48,000 | 67,000 | 48,000 |
| Highway/Campground Access | 38,000 | 120,000 | 200,000 | 407,000 | 211,000 |
| River Access | 2,000 | 20,000 | 32,000 | 32,000 | 20,000 |
| West Side Access | 1,000 | 5,000 | 5,000 | 25,000 | 5,000 |
| Trail Access | 3,000 | 5,000 | 5,000 | 25,000 | 5,000 |
| **Total** | **90,000** | **288,000** | **539,000** | **999,500** | **533,500** |

| **Annual Operation and Maintenance**[2] | **Alt. 1** | **Alt. 2** | **Alt. 3** | **Alt. 4** | **Alt. 5** |
|---|---|---|---|---|---|
| Campgrounds | 22,000 | 33,000 | 48,000 | 59,000 | 45,000 |
| Day Use Areas | 4,000 | 6,000 | 16,000 | 20,000 | 15,000 |
| Signs | 2,500 | 5,000 | 7,000 | 9,000 | 6,000 |
| Interpretive Devices | 3,000 | 4,000 | 8,000 | 10,000 | 6,000 |
| Access Developments | 4,000 | 12,000 | 20,000 | 40,000 | 21,000 |
| **Total** | **35,500** | **60,000** | **99,000** | **138,000** | **93,000** |
| **Annual Program Management**[3] | **Alt. 1** | **Alt. 2** | **Alt. 3** | **Alt. 4** | **Alt. 5** |
| Resource Management (monitoring, inventory,etc..) | 10,000 | 27,000 | 27,000 | 35,000 | 27,000 |
| Information and Ed. Program | 7,000 | 15,000 | 21,000 | 30,000 | 21,000 |
| Campground Hosts | 2,000 | 4,000 | 4,000 | 8,000 | 4,000 |
| Vehicle Costs | 4,500 | 8,500 | 8,500 | 13,000 | 8,500 |
| Equipment Charges | 2,000 | 4,500 | 5,000 | 8,000 | 5,000 |
| Fire Suppression | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 |
| Law Enforcement | 8,000 | 17,000 | 20,000 | 25,000 | 17,000 |
| **Total** | **58,500** | **101,000** | **110,500** | **144,000** | **107,500** |
| **Monitoring Equipment**[4] | **Alt. 1** | **Alt. 2** | **Alt. 3** | **Alt. 4** | **Alt. 5** |
| Water Quality Monitoring Equip. | 1,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| Fish Habitat Survey Equipment | 500 | 2,500 | 2,500 | 2,500 | 2,500 |
| Miscellaneous Equipment | - | 6,500 | 8,500 | 8,500 | 8,500 |
| **Total** | **1,500** | **14,000** | **16,000** | **16,000** | **16,000** |

1) Costs related to survey, design, and construction are included in these figures.

2) This category includes administrative and labor costs associated with maintenance of facilities within the river corridor.

3) Funding for annual program management includes a variety of elements. The elements described are the most important tools necessary for yearly program management in the Lower Crooked River corridor. Administrative costs associated with annual program management are included in these figures.

4) This category includes equipment necessary to govern implementation of the Lower Crooked River Management Plan.

| Value to be Maintained and Enhanced | Key Indicator | Management Standard to be Used | Management Actions Triggered if Standard is Not Met | Sampling Procedure and Frequency |
|---|---|---|---|---|
| **Water Quality** | Fecal Coliform | A log mean of 200 fecal coliform per 100 milliliters based on a minimum of 5 samples in a 30-day period with no more than 10 percent of the samples in a 30-day period exceeding 400 per 100 ml. | Locate source of effluent. Inspect all toilets upstream for leakage. | Grab samples taken to a State-Certified lab; samples taken in spring, summer, and fall on a yearly basis. |
| | Temperature | Temperature equal to or cooler than baseline established during 1993 water years. | Stop management practices that may be contributing to temperature rise. | Monitor temperatures with continuously recording temperature instruments. |
| | Turbidity | Turbidity equal to or clearer than 1993 baseline. | Stop management practices that may be contributing to turbidity rise. | Monitor turbidity with datalogger turbidimeter. Samples taken during flushing flows in fall, winter, spring, and during June, July, and August on a yearly basis. |
| | pH | Maintain pH between 6.5 and 8.5 | Stop management practices that may be contributing to pH rise. | Monitor with a pH datalogger instrument the same frequency as in turbidity. |
| | Dissolved Oxygen | Maintain dissolved oxygen equal to or greater than 5.0 mg./l. | Stop management practices that may be contributing to a reduction in dissolved oxygen. Negotiate for an increase in flow. | Monitor dissolved oxygen with a datalogger instrument weekly during June, July, and August. |
| | Gas Supersaturation | Not to exceed gas saturation of 100 percent. | Regulate out-flow parameters of Bowman Dam. | BOR would monitor gas supersaturation with a continuously recording gas instrument installed in the existing gauge station (reconstruction of Bowman Dam should resolve current gas supersaturation problems). |

| Value to be Maintained and Enhanced | Key Indicator | Management Standard to be Used | Management Actions Triggered if Standard is Not Met | Sampling Procedure and Frequency |
|---|---|---|---|---|
| **Fish Habitat** | Quality and Quantity of Spawning Gravel | Locate areas and measure substrate embedeness and frequency distribution during 1993. Maintain quality and quantity of spawning gravel at 1993 baseline. | Identify cause of degradation to quality and quantity of spawning gravel and mitigate impact. | Conduct yearly substrate embedeness and pebble count. |
| | Rearing Habitat | Maintain pool and habitat quality and quantity at 1991 baseline. | Identify cause of degradation to rearing habitat and mitigate impact. | Conduct annual habitat survey. |
| | Fish Species Composition | Maintain fish species composition using historical baseline data. | Identify cause of degradation to fish species composition and mitigate impact. | Conduct annual fish census. |
| **Riparian Vegetation** | Proper functioning ecological condition as indicated by vegetative and streambank condition. | Riparian vegetation would be managed to maintain or enhance vegetative diversity, biomass, and percent cover using 1992 baseline. Increase streambank area by utilizing 1992 baseline. | Remove/eliminate source of impact (i.e. close campsite, roads, trails, etc.) after inventory assesses the extent of impact. | Continue current riparian resource inventory every three years. Conduct color infra-red aerial reconnaissance every 2 years for the next 10 years. Thereafter, conduct every 5 years. |

| Value to be Maintained and Enhanced | Key Indicator | Management Standard to be Used | Management Actions Triggered if Standard is Not Met | Sampling Procedure and Frequency |
|---|---|---|---|---|
| **Upland Vegetation** | Ecological condition and trend as indicated by the composition of western juniper, sagebrush, idaho fescue, and bluebunch wheatgrass. | Upland vegetation would be managed to maintain ecological condition between mid and late seral status. | Utilize a combination of prescribed fire mechanical vegetation strategies, and mosaic juniper thinning strategies that result in reaching the management standard.<br><br>Short-term spot grazing and chemical management strategies would be used when no other vegetation management tools are effective. | Complete ecological site inventory on all public lands on an annual basis.<br><br>Implement monitoring studies to measure progress in meeting upland management standards. |
| **Wildlife** | River corridor use by raptors and other waterfowl<br><br>Maintenance of unique habitats (cliffs, talus slopes, etc.) and use by associated species.<br><br>Bald Eagle (Haliaetus Leucocephalus) | Historic records compared with future observations should not indicate downward trends.<br><br>Significant loss or degradation of these habitats is observed and/or there is a downward trend in associated species.<br><br>Bald Eagle habitat will be maintained at present standards. | Re-evaluation of river management actions (i.e. campground development, trail placement, etc.).<br><br>Re-evaluation of river management actions (i.e. vegetation management strategies, trail placement etc.).<br><br>Identify all Bald Eagle roost sites and protect trees used for roosting from damage. Restrict recreational use levels near roost sites from December through March if necessary to prevent harassment. | Count/record all nests, raptors, and waterfowl sightings on a regularly scheduled basis.<br><br>Annually inventory habitats in cooperation with ODFW. Associated species will be surveyed during project evaluations.<br><br>Conduct habitat analysis and Bald Eagle count within the entire corridor on an annual basis. |

| Value to be Maintained and Enhanced | Key Indicator | Management Standard to be Used | Management Actions Triggered if Standard is Not Met | Sampling Procedure and Frequency |
|---|---|---|---|---|
| **Cultural Resources** | Cultural Site Integrity | No significant Cultural Resource which is being irreparably damaged by human use or eroded by natural forces to the point that it is in danger of being lost will be acceptable. | Public information and education efforts through brochures, signs, kiosks, and visitor contact points will be implemented.<br><br>Projects with ground disturbing activities or sites experiencing natural degradation would be relocated or stabilized if possible. Project cancellation or mitigating measures would take place where relocating a planned project is not feasible. | Conduct an inventory to identify prehistoric and historic sites or features in areas proposed for surface disturbing projects as needed.<br><br>Each managing agency would maintain a cultural resources database atlas for lands under there jurisdiction. |
| **Scenic Resources** | Projects or modifications which significantly alter landform, vegetation, water, color, or character of the corridor. | Contrasts created by new management activities would not be allowed if they attract the attention of the casual observer within the characteristic landscape. Short-term impacts such as those created by trail building or prescribed fire would be allowed. Natural ecological changes will predominate. | Management actions not consistent with Visual Resources Management (VRM) and Recreation Opportunity Spectrum objectives will be modified or rejected. | Conduct a VRM study every 5 years to ensure projects and other human caused modifications are consistent with management standards.<br><br>Individual projects will be analyzed on a case-by-case basis to ensure protection of outstandingly remarkable values. |

| Value to be Maintained and Enhanced | Key Indicator | Management Standard to be Used | Management Actions Triggered if Standard is Not Met | Sampling Procedure and Frequency |
|---|---|---|---|---|
| **Recreation** | Quality Experience | Maintain or enhance visitor experience using 1991 baseline data derived from the 1991 visitor use survey. | Develop brochures to inform and educate visitors how to avoid peak use periods and reduce conflicts with other recreationists.<br><br>High impact recreation opportunities would be limited to specific geographic areas or excluded if found to significantly impact other visitors or the resource.<br><br>Limit length of stay to 7 nights in developed campgrounds.<br><br>If necessary, recommend management changes to other managing agencies (i.e. ODFW fishing regulations). | Conduct a random visitor use survey every 5 years. Focus on use levels, conflicts, and user need.<br><br>Coordinate with ODFW to conduct an angler preference and statistical creel survey as needed to analyze fishing regulations. |
| **Roads/Trails** | Road erosion and damage related to roadside vegetation and facilities.<br><br>Trail erosion and damage related to trailside vegetation and facilities. | Confine motorized vehicles to designated roads. Maintain roads to established BLM standards.<br><br>Encourage use of designated trails. Maintain trails to established BLM standards. Prevent trail networking using indirect methods. | Increase road maintenance frequency. Reconstruct/relocate roads and related facilities (i.e. signs, vehicle barriers, etc.) to resolve unlawful access, resource damage, and road safety problems.<br><br>Increase trail maintenance frequency. Reconstruct/relocate trails to reduce trail networking and encourage appropriate use. Keep trail maps current. | Monitor routine road maintenance needs twice yearly. Utilize feedback from visitor contact.<br><br>Monitor routine trail maintenance needs twice yearly. Utilize feedback from routine patrols on high use trails.<br><br>Establish monitoring points along high use trails to measure trail depth, width, and drainage. Remeasure points every 2 years for the first 4 years, then every 3 years afterward. |

| Value to be Maintained and Enhanced | Key Indicator | Management Standard to be Used | Management Actions Triggered if Standard is Not Met | Sampling Procedure and Frequency |
|---|---|---|---|---|
| **Camp and Day Use Sites** | Soil stability<br><br>Vegetative loss<br><br>Tree damage<br><br>Facility damage<br><br>Litter Accumulation | Impacts to camp and day use sites will range between light and heavy based on subjective judgement regarding erosion, vegetative change, facility damage, and accumulation of litter as follows:<br><br>Light: Previous ground vegetation in tact allowing natural erosion to occur. Facility damage and litter is not evident. The site has experienced only minimal physical changes.<br><br>Moderate: Vegetative growth is somewhat retarded allowing minor abnormal erosion to occur. Traces of litter can be found within and adjacent to the site. Minor vandalism, repairable by maintenance, is occurring on facilities such as tables. Physical changes to the site could include: minor tree limbing, movement of rocks and semi-stationary facilities.<br><br>Heavy: Use area vegetation is gone but adjacent vegetation still intact. Abnormal erosion within the site is correctable through maintenance. Major littering is evident within and adjacent to the site and can be corrected through maintenance. Major vandalism, repairable by maintenance, is occurring on facilities and physical features such as tables, rocks, trees and other site protection facilities. Physical changes to the site could include: moderate tree limbing, beginning tree root exposure, trails radiate from site, human caused changes to the layout of the use area. All impacts to camp and day use sites could be resolved through routine maintenance.<br><br>(continues) | Using basic site protection measures, harden all sites to maintain sites between light and heavy standards. Campsites which have received extreme impacts will be rehabilitated and closed until levels of impacts have been mitigated to at least moderate. Other actions could include: increased user education efforts in "minimum impact" camping techniques and seasonal closures of entire campgrounds or day use areas if determined necessary. | Inventory all existing and new proposed sites within the river corridor upon approval of this plan.<br><br>Remeasure all sites once every 2 years, or when changed conditions indicate the need.<br><br>Feedback from routine campsite maintenance patrols. |

| Value to be Maintained and Enhanced | Key Indicator | Management Standard to be Used | Management Actions Triggered if Standard is Not Met | Sampling Procedure and Frequency |
|---|---|---|---|---|
| Camp and Day Use Sites (cont) | | Extreme: Use area vegetation is gone and adjacent vegetative growth is retarded allowing abnormal erosion to occur within and adjacent to the site. Maintenance can no longer correct soil and vegetative impacts without allowing for temporary closure of the site. The site experiences perpetual littering. Major vandalism can be corrected through maintenance of facilities but not for vandalism to physical features such as rocks, trees and other features. Physical changes to the site could include: dead or cut trees, tree roots exposed, heavy erosion, compacted soil restricting reestablishment of indigenous vegetation within and adjacent to the site, changes in species composition, major trails and satellite areas radiate from site. Maintenance can no longer correct impacts and the site can no longer sustain long-term use without temporary closure to allow natural rehabilitation to occur. | | |

# *VI. Participants, References and Glossary*

## A. Planning Participants

### Management Participation

Jim Hancock, Prineville District Manager, Bureau of Land Management
Jim Kenna, Deschutes Area Manager, Bureau of Land Management
Jim Budolfson, Recreation and Resources Branch Chief, Bureau of Reclamation

### Technical Planning Team Members

Ed Perault, Outdoor Recreation Planner/Team Leader, Bureau of Land Management
Shaaron Netherton, Supervising Outdoor Recreation Planner, Bureau of Land Management
Steve Jakubowics, Resource Management Planner, Bureau of Reclamation
Bob Adair, Environmental Planning, Bureau of Reclamation

### Agency Associates, Staff, and Volunteers

Amy Stuart, Fish Biologist, Oregon Department of Fish and Wildlife
Brian Ferry, Wildlife Specialist, Oregon Department of Fish and Wildlife
Scott Stuemke, Confederated Tribes of the Warm Springs Reservation
Louie Pitt, Confederated Tribes of the Warm Springs Reservation
Chester Schmidt, DTP Specialist, Bureau of Land Management
James Sippel, Recreation Technician, Bureau of Land Management
John Heilmeyer, Riparian Coordinator, Bureau of Land Management
Jan Hanf, Wildlife Biologist, Bureau of Land Management
Dave Young, Fish Biologist, Bureau of Land Management
Ron Halvorson, Botany/T&E Coordinator, Bureau of Land Management
Marci Todd, Archaeologist, Bureau of Land Management
Larry Thomas, Soil/Water/Air, Bureau of Land Management
Dennis Davis, Geologist, Bureau of Land Management
Steve Lent, Fire Management Officer, Bureau of Land Management
Ron VanDomelen, Technical Advisor, Bureau of Land Management
Teal Purrington, Range Conservationist, Bureau of Land Management
Tharen Jackson, Maintenance Worker, Bureau of Land Management
Steve Castro-Shrader, Law Enforcement, Bureau of Land Management
Hugh Moore, Work Group Member, Ochoco Irrigation
Joyce Barney, Work Group Member, Local Broker
Be Be Schindler, Work Group Member, Prineville Chamber of Commerce
Gordon Chandler, Work Group Member, Central Oregon Flyfishers
Craig Lacy, Work Group Member, Oregon Trout
Gordon Moore, Crook County Planner

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## *C. Glossary*

**Access** - The ability of recreationists to reach the areas in which they wish to recreate.

**Allotment** - An area of land where one or more livestock operators graze their livestock.

**Alternative** - A comprehensive management strategy; when a federal agency is considering an action, NEPA requires the agency to develop and analyze a range of reasonable alternatives, including a "no action" or "no change" alternative. The alternatives must respond to the issues, and must show a reasonable range of actions.

**Aquatic** - Living or growing in or on the water.

**Archaeological Site** - Geographic locale containing structures, artifacts, material remains and/or other evidence of past human activity.

**Artificial Structures** - Constructed cavities which provide shelter for wildlife, such as bird houses.

**Basic Site Protection Measures** - Engineering techniques designed to reduce or control recreation impacts. In campsites it could include natural or man-made vehicle barriers, graveled surfaces, toilets, footpaths, steps and vegetative plantings. (Also see campsite stabilization.)

**Bike** - A non-motorized form of transportation normally with two wheels and pedals, many are referred to as mountain bikes.

**Biodiversity** - The relative abundance and variety of species, both plant and animal, in a given area.

**Campground** - One or more developed campsites in a specific area.

**Camping** - Outdoor living for recreation.

**Campsite** - Individual unit for camping.

**Campsite Stabilization** - Measures taken to reduce camper impact on the natural resources, such as hardening a footpath. Also see Basic site protection measures.

**Campsite Rehabilitation** - Measures taken to restore damaged campsites and to prevent further damage to natural resources, such as planting grass and shrubs.

**Ceded Lands** - Lands and certain rights ceded to the United States of America by the Confederated Tribes of the Warm Springs under the treaty of 1855.

**Compaction** - The process of packing firmly and closely together; the state of being so packed, (ie. compaction of soil from intense human use or vehicular activity). Soil compaction results from particles being pressed together so that the volume of soil is reduced. It is influenced by the physical properties of the soil, moisture content, and the type and amount of compactive effort.

**Crucial Wildlife Habitat** - Parts of the habitat needed to sustain a wildlife population at critical periods of its life cycle. This is often a limiting factor on populations, such as breeding habitat and winter habitat.

**Cumulative Effects** - Effects on the environment resulting from actions that are individually minor, but that add up to a greater total effect as they take place over a period of time.

**Cultural Resources** - Remains of human (historical and archaeological) activity, occupation, or endeavor, reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture and natural features that were of importance in past human events. Cultural resources consist of: (1) physical remains; (2) areas where significant human events occurred, even though evidence of the events no longer remains; and (3) the environment immediately surrounding the actual resource.

**Day Use Area** - An area primarily set aside for day use parking, picnicking, and/or access to a variety of day use recreation opportunities.

**Desired Future Condition** - A vision of the desired future state of a specific area. Desired future condition gives managers goals for the area, but recognizes the dynamic state of the ecosystem, instead of listing numerical outputs as goals.

**Developed Campground** - Accessible by motor vehicle and contains improvements for camper comfort and sanitary facilities such as toilets, drinking water, tables and trash receptacles.

**Early Seral** - Ecological status that corresponds to 0 to 25 percent of the plant composition found in the potential natural community. Synonymous with poor range condition.

**Ecological Status** - Four classes of successional stage (or range condition) used to express the degree to which the composition of the present plant community reflects that of climax. The four classes (followed by the percentage of plant community that is climax for the site) are: Potential, Natural Community, 76-100; Late seral, 51-75; Mid-seral, 26-50 and Early seral, 0-25.

**Ecosystem** - An interacting system of living organisms considered together with their environment; examples include talus ecosystems or river ecosystems.

**Endangered Species** - A plant or animal species whose prospects for survival or reproduction are in immediate danger as designated by the Secretary of the Interior and as further defined by the Endangered Species Act of 1973, as amended.

**Environmental Assessment** - A concise public document that evaluates a proposal for the possibility of significant environmental impacts; the analysis is required by NEPA laws. An environmental assessment results in either a FONSI (Finding of No Significant Impact) and decision notice; or, if impacts will be significant, the agency must then go on to prepare an environmental impact statement.

**Erosion** - Detachment and movement of soil or rock fragments by water, wind, ice or gravity.

**Fecal Coliform** - A bacteria found in the human colon; a fecal coliform count is use as an indicator of fecal contamination, if any, in water.

**FONSI** - Finding of No Significant Impact. Required by NEPA when a federal agency prepares an environmental assessment; documents the reasons why the impacts of the proposed action are not significant, and therefore, the agency is not preparing an environmental impact statement.

**Forage** - All browse and herbaceous plants that are available to grazing animals including wildlife and domestic livestock.

**Gray Water** - Sink or other non-sewage waste water.

**Ground Cover** - Grasses or other plants that keep soil from being blown or washed away.

**Guide** - A person who provides services by leading one or more other persons in outdoor recreation activities for a fee.

**Guide Permit** - A license to carry out the activities of a guide.

**Habitat** - The area where a plant or animal lives and grows under natural conditions. Habitat consists of living and non-living attributes, and provides all requirements for food and shelter.

**Historic Site** - Locales used by immigrants from the 1820s to 1930s.

**Impact** - A change in the environment caused by the activities of humans.

**Issue** - A subject or question of widespread public discussion or interest regarding management of a geographic area which has been identified through public participation.

**Late Seral** - Ecological status corresponding to 51 to 75 percent of the plant composition found in the potential natural plant community. Synonymous with good range condition.

**Launch Site** - The riverbank location where boats are placed in or removed from the river.

**Limits of Acceptable Change** - A process for establishing acceptable and appropriate conditions based on the premise that change to the ecological and social conditions of an area will occur as a result of natural and human factors. The goal of management is to keep the character and rate of change due to human factors within acceptable levels.

**Lower Crooked Wild and Scenic River Area** - The area within the proposed wild and scenic river boundaries originating at Bowman Dam and ending 8 miles down river near Highway 27 mile marker 12. The area averages not more than 320 acres per rivermile.

**Major Site Protection Measures** - Engineering techniques designed to physically restrict use to control recreation impacts. In campsites it could include natural or man-made vehicle barriers,

graveled or asphalt surfaces, toilets, tent pads, footpaths, steps and vegetative plantings on a much larger scale than basic site protection measures. (Also see campsite stabilization.)

**Management Objectives** - Parameters or goals to be used as standards to measure the success of the management plan.

**Management Plan** - A plan guiding overall management of an area administered by a federal or state agency; plan usually includes objectives, goals, management actions, and monitoring plans.

**Mid-Seral** - Ecological status that corresponds to 26 to 50 percent of the composition found in the potential natural plant community. Synonymous with fair range condition.

**Minimum Instream Flow** - Flows released from Prineville Reservoir that are required by law (10 cubic feet per second). This minimum flow was established to help protect instream resources such as fish and aquatic habitat.

**Mitigation** - Steps taken to avoid or minimize negative environmental impacts. Mitigation can include: avoiding the impact by not taking a certain action; minimizing impacts by limiting the degree or magnitude of the action; rectifying the impact by repairing or restoring the affected environment; reducing the impact by protective steps required with the action; and, compensating for the impact by replacing or providing substitute resources.

**Monitoring** - The orderly collection of data to evaluate the effects or changes that result from management actions.

**Multiple Use** - The harmonious use of land or water resources for more than one purpose.

**National Register of Historic Places (NRHP)** - The official list, established by the Historic Preservation Act of 1966, of the nation's cultural resources worthy of preservation.

**National Environmental Policy Act** - Commonly known as NEPA; became law in 1969. NEPA is the basic national charter for protection of the environment. The Act requires all federal agencies to consider and analyze all significant environmental impacts of any action proposed by those agencies; to inform and involve the public in the agency's decisionmaking process; and to consider the environmental impacts in the agency's decisionmaking process.

**National Wild and Scenic Rivers System** - A system of Congressionally designated rivers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural and/or other values and are preserved in a free-flowing condition. The system is of three types: (1) Recreation—rivers or sections of rivers readily accessible by road or railroad that may have some development along their shorelines and that may have undergone some impoundment or diversion in the past; (2) Scenic—rivers or sections of rivers free of impoundments, with shorelines or watersheds still largely undeveloped but accessible in places by roads; and (3) Wild—rivers or sections of rivers free of impoundments and generally inaccessible except by trails, with watersheds or shorelines essentially primitive and waters unpolluted.

**Native Species** - Plants or animals that are indigenous to an area.

**Non-Commercial** - Activities in which there is a bona fide sharing of the cost of the activity between all participants.

**No-Trace Camping** - The art of camping without leaving signs of use.

**Noxious Weed** - A plant specified by law as being especially undesirable, troublesome and difficult to control.

**Off-Highway Vehicle (OHV)** - Any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding (1) any nonamphibious, registered motorboat; (2) emergency vehicles; and (3) vehicles in official use.

**Outfitter** - A person who for compensation or other gain, provides equipment, supplies or materials for the conduct of outdoor recreational activities.

**Outstandingly Remarkable Values** - Term used in the National Wild and Scenic Rivers Act of 1968; to qualify as outstandingly remarkable, a resource value must be unique, rare, or exemplary feature that is significant at a regional or national level.

**Permittee** - One who holds a license to use public lands or waters for financial gain.

**Plan Objectives** - Guiding statements or goals that present the purposes and overall intent of the planning effort.

**Planning Area** - The Lower Crooked River and its immediate environment within the National Wild and Scenic Rivers boundary between Bowman Dam and Highway 27 mile marker 12.

**Potential Natural Community (PNC)** - The final or stable biotic community in a successional series. Usually self-perpetuating, it corresponds to 76 to 100 percent of the plant composition found in the potential natural plant community. Synonymous with excellent range condition.

**Prehistoric** - The period of time before written records.

**Public Lands** - Any land and interest in land managed by the United States Government and administered by the Secretary of the Interior through the Bureau of Land Management or Bureau of Reclamation.

**Recreation Opportunity Spectrum** - A framework for understanding and defining various classes of recreation environments, activities, and experiences. The classes are defined in terms of the opportunities to have different kinds of experiences; examples are "roaded natural" and semi-primitive.

**Resident Fish** - Fish species that complete their entire life cycle in freshwater; non-anadromous fish; an example is rainbow trout.

**Resource Assessment** - An evaluation of the resources and values associated with a wild and scenic river and the river corridor; the evaluation determines the level of significance of river-related values.

**Right-of-Way** - A permit or easement which authorizes a specific use of a specific area of land.

**Riparian Area** - The land adjacent to water, where water, soil and vegetation interact to form a unique microclimate.

**Roaded Natural** - One category on the recreation opportunity spectrum (ROS). "Roaded Natural" describes an environment where natural characteristics remain dominant, but there is moderate evidence of human development, and moderate amounts of contact with other people is expected during recreation.

**Scoping** - The process by which significant issues relating to a proposal are identified. It includes eliciting public comment, evaluating concerns and developing issues and alternatives for consideration.

**Sediment** - Soil, rock particles and organic or other debris carried from one place to another by wind, water or gravity.

**Sedimentation** - A process where material carried in suspension by water flows into streams and rivers, increasing turbidity and eventually settling to the bottom.

**Semi-Primitive Non-Motorized** - One category on the recreation opportunity spectrum (ROS). "Semi-Primitive Non-Motorized" describes an environment where the natural environment dominates the characteristics of the area and development is very limited. Motorized use is prohibited and interaction among users is low.

**Special Status Species** - A threatened, endangered or sensitive plant or animal species.

**Stewardship** - The exercise of responsible care of land, water or other natural resources, or recreational resources such as a campsite.

**Succession** - The process of vegetative community change towards climax or potential natural community.

**Threatened Species** - A plant or animal species the Secretary of Interior has determined to be endangered in the foreseeable future throughout all or most of its range.

**Treaty Rights** - Legal rights of the Confederated Tribes of the Warm Springs Indians, established in their treaty with the United States Government in 1855.

**Turbidity** - A measure of water clarity.

**Upland** - All rangelands other than riparian or wetland areas.

**Vegetative Manipulation** - Alteration of present vegetation using fire, plowing or other means to manipulate natural successional trends.

**Visual Resources Management (VRM)** - VRM has dual program purposes: to manage the quality of the visual environment, and to reduce the visual impact of development activities while maintaining the effectiveness of the management plan objectives. It is a specific process that can be mapped and incorporated into design planning for projects ranging from prescribed burning to campground development.

**Water Quality** - The chemical, physical and biological characteristics of water with respect to its suitability for a particular use.

**Watershed** - Lands which are enclosed by a continuous hydrologic drainage divide and located upslope from a specified point on a stream.

**Wild and Scenic River** - Those rivers or sections of rivers designated as Wild an Scenic by Congressional action, either under the 1968 Wild and Scenic Rivers Act, or under supplements and amendments to that act. The Lower Crooked (Chimney Rock Segment) is one of 40 river segments designated in the Omnibus Oregon Wild and Scenic River Act 1988.

# *Appendix A*

## *Lower Crooked Wild and Scenic River Boundary Legals*

Legal description of the administrative boundary commencing at the east-west centerline of the southeast 1/4 section of section 20, T. 16 S., R. 16 E., W.M. and extending upstream to Bowman Dam. Refer to maps in Appendix G for visual representation of boundary legals.

T. 16 S., R. 16 E., W.M.

Section 20:

Beginning at the center south 1/16 corner, thence southerly to the 1/4 corner common to sections 20 and 29.

Section 29:

Thence southerly to the center 1/4 corner, thence easterly to center east 1/16 corner, thence southerly to the east 1/16 corner common to sections 29 and 32.

Section 32:

Thence southeasterly to center west 1/16 corner, thence southerly to west 1/16 corner common to section 32, T. 16 S., R. 16 E. and section 5, T. 17 S., R. 16 E.

T. 17 S., R 16 E., W.M.

Section 5:

Thence southerly to center west 1/16 corner, thence easterly to the 1/4 corner common to section 4 and 5.

Section 4:

Thence northeasterly to the northwest 1/16 corner, thence easterly to the center north 1/16 corner, thence southeasterly to south 1/16 corner common to sections 3 and 4.

Section 3:

Thence easterly to southwest 1/16 corner, thence southerly to west 1/16 corner common to sections 3 and 10.

Section 10:

Thence southeasterly to the center south 1/16 corner, thence easterly to the south 1/16 corner common to sections 10 and 11.

Section 11:

Thence northeasterly to a point on the centerline at the south end of the Bowman Dam, thence northwesterly along said centerline to the north end of the dam, thence northeasterly to west 1/16 corner common to sections 2 and 11.

Section 2:

Thence northwesterly to south 1/16 corner common to sections 2 and 3.

Section 3:

Thence westerly to southeast 1/16 corner, thence northerly to northeast 1/16 corner, thence northwesterly to 1/4 corner common to sections 3, T. 17 S., R. 16 E. and section 34, T. 16 S., R. 16 E.

T. 16 S., R. 16 E., W.M.

Section 34:

Thence northwesterly to south 1/16 corner common to sections 33 and 34, thence northerly to 1/4 corner common to sections 33 and 34.

Section 33:

Thence northwesterly to northeast 1/16 corner, thence westerly to northwest 1/16 corner, thence northerly to west 1/16 corner common to sections 28 and 33.

Section 28:

Thence northerly to center west 1/16 corner, thence northwesterly to north 1/16 corner common to sections 28 and 29, thence northerly to the section corner common to sections 20, 21, 28, and 29, thence easterly to west 1/16 corner common to sections 21 and 28.

Section 21:

Thence northerly to the southwest 1/16 corner, thence westerly to Point of Beginning.

# *Appendix B*

## *Campgroundl/Day Use Area Matrix*

| | | Overnight Campsites | Day Use Sites | Day Use Parking | Fees Charged | Group Campsites | Picnic Tables | Pit Toilets | Sink Water Holes | Garbage Cans | Fire Grates | Water | Access Surface | Barrier Free Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Castle Rock | Alt 1 | 5 | ● | ● | ● | | ● | ● | ● | ● | | | G | * |
| | Alt 2 | 5 | | ● | | | ● | ● | ● | ● | | | G | 2 |
| | Alt 3 | 7 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | G | 1 |
| | Alt 4 | 10 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | O | 1 |
| | Pref Alt | 5 | ● | ● | ● | | ● | ● | ● | ● | ● | | G | 2 |
| Stillwater | Alt 1 | 8 | | | | | ● | ● | ● | ● | ● | | G | * |
| | Alt 2 | 8 | | ● | ● | | ● | ● | ● | ● | ● | | G | 2 |
| | Alt 3 | 10 | | ● | ● | ● | ● | ● | ● | ● | ● | ● | G | 1 |
| | Alt 4 | 14 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | O | 1 |
| | Pref Alt | 10 | | ● | ● | ● | ● | ● | ● | ● | ● | ● | G | 2 |
| Greenwood | Alt 1 | 6 | ● | ● | | | ● | ● | ● | ● | | | S | * |
| | Alt 2 | | ● | ● | | | ● | ● | | ● | | | G | 2 |
| | Alt 3 | 4 | | | ● | | ● | ● | ● | ● | ● | | G | 2 |
| | Alt 4 | 4 | | | ● | | ● | ● | ● | ● | ● | ● | O | 1 |
| | Pref Alt | | ● | ● | | | ● | ● | ● | ● | | | G | 2 |
| Lone Pine | Alt 1 | 8 | | | | | ● | ● | | ● | | | S/G | * |
| | Alt 2 | 8 | | ● | | | ● | ● | ● | ● | | | G | 2 |
| | Alt 3 | 10 | ● | ● | ● | | ● | ● | ● | ● | ● | | G | 1 |
| | Alt 4 | 10 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | O | 1 |
| | Pref Alt | 8 | | | ● | | ● | ● | ● | ● | ● | | G | 2 |
| Lower Palisades | Alt 1 | 12 | ● | ● | ● | | ● | ● | ● | ● | ● | | G | * |
| | Alt 2 | 10 | ● | ● | ● | | ● | ● | ● | ● | ● | | G | 2 |
| | Alt 3 | 15 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | G | 1 |
| | Alt 4 | 20 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | O | 1 |
| | Pref Alt | 15 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | G | 2 |

**S** soil
**G** gravel
**O** oil

* New facilities (barrier free access)
**E** Easy access
**1** Most facilities accessible
**2** Difficult accessibility

| | | Overnight Campsites | Day Use Sites | Day Use Parking | Fees Charged | Group Campsites | Picnic Tables | Pit Toilets | Sink Water Holes | Garbage Cans | Fire Grates | Water | Access Surface | Barrier Free Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chimney Rock | Alt 1 | 16 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | G | * |
| | Alt 2 | 16 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | G | 2 |
| | Alt 3 | 20 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | G | 1 |
| | Alt 4 | 40 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | O | E |
| | Pref Alt | 20 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | G/O | 1 |
| Cobble Rock | Alt 1 | 6 | ● | ● | | | ● | ● | | ● | | | S/G | * |
| | Alt 2 | | ● | ● | | | ● | ● | | ● | | | G | 2 |
| | Alt 3 | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | | G | 2 |
| | Alt 4 | 15 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | O | 1 |
| | Pref Alt | 15 | | | ● | | ● | ● | ● | ● | ● | | G | 2 |
| Post Pile | Alt 1 | 7 | | | ● | | ● | ● | ● | ● | ● | | G | * |
| | Alt 2 | 7 | | | ● | | ● | ● | ● | ● | ● | | G | 2 |
| | Alt 3 | 10 | | ● | ● | | ● | ● | ● | ● | ● | | G | 1 |
| | Alt 4 | 10 | | ● | ● | ● | ● | ● | ● | ● | ● | ● | O | 1 |
| | Pref Alt | 10 | | | ● | | ● | ● | ● | ● | ● | ● | G | 2 |
| Poison Butte | Alt 1 | 5 | | | | | ● | ● | ● | ● | ● | | S/G | * |
| | Alt 2 | 4 | | | ● | | ● | ● | ● | ● | ● | | G | 2 |
| | Alt 3 | 5 | | | ● | | ● | ● | ● | ● | ● | | G | 1 |
| | Alt 4 | 10 | | | ● | | ● | ● | ● | ● | ● | ● | O | 1 |
| | Pref Alt | 6 | | | ● | ● | ● | ● | ● | ● | ● | | G | 1 |
| Big Bend | Alt 1 | 18 | ● | ● | | | | | | | | | S | * |
| | Alt 2 | 15 | ● | ● | ● | | ● | ● | ● | ● | ● | | G | 2 |
| | Alt 3 | 20 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | G | 1 |
| | Alt 4 | 30 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | O | 1 |
| | Pref Alt | 30 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | G/O | 1 |

| | | Overnight Campsites | Day Use Sites | Day Use Parking | Fees Charged | Group Campsites | Picnic Tables | Pit Toilets | Sink Water Holes | Garbage Cans | Fire Grates | Water | Access Surface | Barrier Free Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Lone Pine | Alt 1 | | | | | | | | | | | | | |
| | Alt 2 | | | | | | | | | | | | | |
| | Alt 3 | | ● | ● | | | ● | ● | | ● | | | G | 2 |
| | Alt 4 | | ● | ● | | | ● | ● | | ● | | | O | 2 |
| | Pref Alt | | ● | ● | | | ● | ● | | ● | | | G | 2 |
| Quarry Area | Alt 1 | | | | | | | | | | | | | |
| | Alt 2 | | | | | | | | | | | | | |
| | Alt 3 | | ● | ● | | | ● | | | ● | | | G | 2 |
| | Alt 4 | | ● | ● | | | ● | ● | | ● | | | O | 2 |
| | Pref Alt | | | | | | | | | | | | | |
| Upper Palisades | Alt 1 | | | | | | | | | | | | | |
| | Alt 2 | | | | | | | | | | | | | |
| | Alt 3 | | ● | ● | | | ● | | | ● | | | G | 2 |
| | Alt 4 | | ● | ● | | | ● | ● | | ● | | | O | 2 |
| | Pref Alt | | ● | ● | | | ● | ● | | ● | | | G | 2 |
| Rim Trailhead | Alt 1 | | | | | | | | | | | | | |
| | Alt 2 | | | | | | | | | | | | | |
| | Alt 3 | | ● | ● | | | ● | | | ● | | | G | 2 |
| | Alt 4 | | ● | ● | | | ● | ● | | ● | | | O | 2 |
| | Pref Alt | | ● | ● | | | ● | ● | | | | | G | 2 |
| Upper Poison Butte | Alt 1 | | | | | | | | | | | | | |
| | Alt 2 | | | | | | | | | | | | | |
| | Alt 3 | | ● | ● | | | ● | | | ● | | | G | 2 |
| | Alt 4 | | ● | ● | | | ● | ● | | ● | | | O | 2 |
| | Pref Alt | | ● | ● | | | ● | | | ● | | | G | 2 |

# Appendix C

## Highway Parking and Pullout Matrix

| Highway | | No. | Site Name | Alt 1 | | Alt 2 | | Alt 3 | | Alt 4 | | Pref Alt | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mile | Side | Aprons | | P | A | P | A | P | A | P | A | P | A |
| 11.95 | W | | | U | U | U | S | S | S | S | S | S | S |
| 12.15 | W | | | U | U | U | S | S | S | S | S | S | S |
| 12.28 | W | | | U | U | S | S | S | S | S | S | S | S |
| 12.30 | W | 1 | Castle Rock | S | U | S | S | D | S | D | S | D | S |
| 12.45 | W | | | U | U | U | U | S | S | S | S | S | S |
| 12.65 | W | | | U | U | S | S | S | S | S | S | S | S |
| 12.90 | W | | | S | U | S | S | D | S | D | S | D | S |
| 13.30 | W | | | U | U | U | U | S | S | S | S | U | U |
| 13.50 | W | 1 | Stillwater | S | U | S | S | D | S | D | D | D | S |
| 13.90 | W | | | U | U | S | S | S | S | S | S | S | S |
| 14.00 | W | | | U | U | S | S | S | S | S | S | S | S |
| 14.30 | W | 2 | Greenwood | U | U | S | S | D | S | D | S | D | S |
| 14.65 | W | 1 | Lone Pine | S | U | S | S | D | S | D | S | D | S |
| 14.70 | W | 2 | Upper Lone Pine | S | U | S | S | D | S | D | S | D | S |
| 14.90 | E | | | U | - | U | - | S | - | S | - | U | - |
| 15.20 | W | 1 | Lower Palisades | U | U | S | S | D | S | D | D | D | S |
| 15.40 | E | 1 | Quarry Area | U | - | * | - | D | - | D | - | * | - |
| 15.40 | W | 2 | Upper Palisades | U | U | S | S | D | S | D | S | D | S |
| 16.00 | E | | | U | - | S | - | S | - | S | - | S | - |
| 16.25 | E | | | U | - | S | - | S | - | S | - | S | - |
| 16.50 | W | 1 | Chimney Rock | S | U | S | S | D | D | D | D | D | D |
| 16.55 | E | 1 | Rim Trailhead | U | - | S | - | D | - | D | - | D | - |
| 16.60 | W | | | S | U | S | S | D | S | D | S | D | S |
| 16.85 | E | | | U | U | S | U | S | S | S | S | S | S |
| 17.00 | W | | | U | U | S | S | S | S | S | S | S | S |
| 17.10 | W | 1 | Cobble Rock | S | U | S | S | D | S | D | S | D | S |
| 17.40 | E | | | S | U | S | S | D | S | D | S | D | S |
| 17.60 | W | 1 | Post Pile | S | U | S | S | D | S | D | S | D | S |
| 17.65 | W | | | U | U | S | S | S | S | S | S | S | S |
| 17.85 | W | | | U | U | S | S | S | S | S | S | S | S |
| 17.90 | E | | | U | - | S | - | S | - | S | - | S | - |
| 18.00 | W | | | U | U | S | S | S | S | S | S | S | S |
| 18.10 | W | 1 | Upper Poison Butte | U | U | S | S | D | S | D | S | D | S |
| 18.30 | W | 1 | Poison Butte | S | U | S | S | D | S | D | S | D | S |
| 18.45 | E | | | S | U | S | S | D | S | D | S | D | S |
| 18.80 | W | | | U | U | S | S | S | S | S | S | S | S |
| 18.85 | W | | | U | U | S | S | S | S | S | S | S | S |
| 18.89 | E | | | U | U | S | S | S | S | S | S | S | S |
| 19.00 | E | | | U | U | S | S | S | S | S | S | S | S |
| 19.10 | W | 1 | Big Bend | S | U | S | S | D | S | D | D | D | S |

**P** parking
**A** river trail access
**E** East
**W** West

**U** undeveloped (parking-soil/gravel, trails-soil)
**S** semi-developed (parking-stabilized w/gravel, trails-gravel if needed)
**D** developed (parking-asphalt, trails-asphalt)

* closed
– no river trails nearby

# *Appendix D*

## *Recreation/Visitor Use Survey*
## *Lower Crooked Wild and Scenic River*

**Summer 1991**

All answers are depicted in percentages by the total number of respondents (126). Therefore, percentages will not always add up to 100 percent. More detailed survey information is available at the BLM, Prineville District Office.

### General Information

**1A. Location of Visit to Area**

| | |
|---|---|
| 6% | Castle Rock |
| 10% | Stillwater |
| 5% | Greenwood |
| 8% | Lone Pine |
| 18% | Lower Palisades |
| 15% | Chimney Rock |
| 13% | Cobble Rock |
| 6% | Post Pile |
| 10% | Poison Butte |
| 4% | Crooked River Corridor |
| 5% | Big Bend |

**1B. Other Areas Visited**

| | |
|---|---|
| 95% | Prineville Reservoir |
| 5% | Adjacent public lands |

**2. Number of People in Group**

| | |
|---|---|
| 6% | 1 |
| 30% | 2 |
| 37% | 3 - 5 |
| 13% | 6 - 9 |
| 13% | 10+ |

**3. Travel Method**

| | |
|---|---|
| 16% | Car |
| 39% | Pick-up (Truck, etc. either 2 or 4-wheel drive) |
| 19% | Motorhome (RV, Van, Camper trailer) |
| 1% | Motorcycle |

13% Car and truck
4% Car and motorhome
8% Truck and motorhome

## Trip Information

**4. Visiting the Area is:**

83% Primary trip destination
13% One of several planned stops
4% Unplanned stop

**5. Times Visited the Area in the Last 5 Years**

14% First time
3% Once before
9% Two/three times
74% Four or more

**6. Description of Group**

6% Alone
56% Family
12% Friends
2% Organization
23% Family and friends
1% Friends and organization

**7. Place of Origin**

17% Prineville (local area)
14% Central Oregon (Redmond, Sisters, Bend, Madras, The Dalles, east to Mitchell)
2% Eastern Oregon (John Day east including Pendleton, La Grande, Lakeview, etc.)
3% Southwest Oregon (Roseburg, Grants Pass, Ashland, Medford, Klamath Falls, all south coastal cities)
1% Northwest Oregon (Newport up to Astoria)
48% Portland Metropolitan Area (Milwaukie, Gresham, Beaverton, Tigard, etc.)
9% Willamette Valley (McMinnville to Eugene)
2% Another state (Florida, Arizona)
3% California
1% Washington state

**8a. Length of Stay**

14% One day
20% Two days
27% Three days
31% Four to seven days
8% More than seven days

**8b. Time of Arrival**

29% Morning (6:00 a.m. to 11:59 p.m.)
44% Afternoon (12:00 p.m. to 5:59 p.m.)
27% Evening (6:00 p.m. to 5:59 a.m.)

**9. Time of Departure**

14% Morning (6:00 a.m. to 11:59 p.m.)
57% Afternoon (12:00 p.m. to 5:59 p.m.)
29% Evening (6:00 p.m. to 5:59 a.m.)

**Recreation Activities and Equipment**

**10. Recreation Activity Engaged in**

84% Camping
4% Biking
92% Fishing
5% Swimming
52% Sightseeing
13% Photography
1% Hunting
35% Hiking
0% Kayaking
3% Rafting
15% Picnicking
66% Wildlife observation
10% Vehicle touring
3% Canoeing
2% Sunbathing
1% Star gazing
2% Boating
2% Firearm practice

## 11. Equipment Used in the Area

| | |
|---|---|
| 35% | Car |
| 15% | Four wheel drive |
| 17% | Van |
| 5% | Standard bicycle |
| 0% | Horse/mule |
| 61% | Tent |
| 2% | Canoe/Kayak |
| 0% | Jet boat |
| 51% | Pick-up |
| 18% | Motor Home |
| 1% | Motorized Trail Bike |
| 2% | Mountain Bike |
| 35% | Camper Trailer |
| 15% | Raft |
| 2% | Row Boat |
| 2% | Motorboat |
| 1% | Canoe |
| 2% | Inner Tube |
| 1% | Rifle |
| 1% | Motorcycle |

## 12. Primary Reason for Visiting the Area

| | |
|---|---|
| 2% | Experiencing new and different things |
| 47% | Feeling isolated |
| 16% | Resting physically |
| 8% | Doing something with family |
| 9% | Giving mind a rest |
| 9% | Being with friends |
| 0% | Chancing dangerous situations |
| 3% | Developing skills |
| 1% | Talking to new people |
| 3% | Learning more about nature |
| 0% | Keeping physically fit |
| 10% | Release tension |
| 3% | Local |
| 1% | Like facilities/services |
| 7% | Weather |
| 3% | Habit/tradition |
| 27% | Love the area |
| 34% | Fishing |
| 1% | Observe wildlife |
| 1% | Firearm practice |
| 2% | Recreation/enjoyment |

**13. Were Expectations Met?**

| | |
|---|---|
| 63% | Met |
| 22% | Mostly met |
| 6% | Neutral |
| 5% | Mostly not met |
| 3% | Not met |

**14. Additional Comments:**

**Desired Facilities**

| | |
|---|---|
| 9% | More toilets |
| 3% | More garbage cans |
| 9% | More water |
| 3% | More gravel |
| 4% | More picnic tables |
| 1% | More pavement |
| 3% | More administrative signs (at facilities) |
| 1% | More campsites |
| 2% | More grey water disposal areas |
| 3% | Add trails (general) |
| 1% | Walkway along the highway |
| 1% | Add hose for water pump for RV's |
| 1% | Add group sites |
| 2% | Add fire grates |
| 1% | Close some of the access roads |
| 1% | Number the campsites |

**Desired Services**

| | |
|---|---|
| 3% | Reservations |
| 1% | Supply fire wood |

**Facilities/Services Not Desired**

| | |
|---|---|
| 5% | Gravel |
| 1% | Pavement |
| 1% | Fees |
| 1% | Fences |
| 1% | Hiking trails |
| 50% | No more development |
| 9% | Less development |

**Improve Fisheries/Water Quality**

5% Improve fisheries (general)
6% Lower fish limit
5% Catch and release barbless artificial only
6% Reduce window size of fish take
1% Build fishing ladders at downstream dams for passage
1% Increase water flow during winter time
1% Restrict fishing when water is low
2% Enforce fishing regulations
8% BOR should establish minimum flow level
35 Improve water quality

**Don't Improve the Fisheries**

3% Leave ODFW regulations the same

**Potential User Conflicts**

1% Separate rafters from fishermen

**Desired Changes in Rules and Regulations**

12% Reduce fire restrictions; want campfires

**Facilities/Services that Big Bend Needs**

1% Trash cans
1% Toilets
1% More patrol at reservoir

**Compliments/Complaints**

3% Campground Host is great
8% Like gravel
3% Too much litter
3% Campground host rude
1% Vegetation being destroyed
1% Too crowded

# *Appendix E*

## *Visual Resources Management Study 1991 of the Lower Crooked Wild and Scenic River (Chimney Rock Segment)*

### A. Introduction

The Wild and Scenic Rivers System was enacted by Congress in 1968 with the Wild and Scenic Rivers Act. This act was created to protect rivers in their free-flowing state, to recognize the importance of rivers to our natural and cultural heritage, and to create partnerships between local, state, tribal, and federal agencies in determining the future of river systems.

The Oregon Omnibus Wild and Scenic Rivers Act, enacted by Congress in 1988, designated 40 new river segments located in Oregon for inclusion under the 1968 Act. Included for protection in the 1988 Act is the Lower Crooked River.

The responsibility to protect or enhance resource values within river corridors has been mandated to each agency responsible for all or part of a designated river. Among these, aesthetics has been identified as an important resource requiring special attention and management. The National Environmental Policy Act of 1969, among other things, calls the government in Section 101 to "...Use all practical means [to] ...assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings." Again, with the Federal Land Policy and Management Act of 1976, the Bureau of Land Management was required in Section 102(a)(8) to manage the public lands "...in a manner that will protect the quality of the ...scenic ...values."

Using BLM manual H-8410-1 of the Visual Resource Management Program (VRM), this document has been prepared in accordance with Congressional mandates to aid in the management of the river from a visual perspective, as a reference for future Limits of Acceptable Change within the river corridor, and to protect the inherent natural qualities of the Lower Crooked National Wild and Scenic River. A complete description of the VRM study results are available in the BLM, Prineville District Office.

### B. Criteria

The Chimney Rock Segment of the Lower Crooked Wild and Scenic River (WSR) consists of a corridor including the river gorge and rim areas of the Crooked River between Rivermiles 64.4 and 72.5. Approximately 2,560 acres are located within the WSR boundaries. The segment is located approximately 12 miles south of Prineville, OR and approximately 25 miles west of Bend, OR.

All Federal and private lands of the river area are addressed in this inventory. The WSR corridor is broken down into five Scenic Quality Rating Units (SQRU) located in, but not restricted to, the WSR boundaries.

Boundary lines of SQRU's are prioritized and delineated first by natural features such as visual line of sight boundaries (viewsheds), second by roads, and last by property boundaries where applicable. Rim boundaries are defined by any point from which the river is visible; for example any area where the construction of a building would be or is seen from the river.

SQRU's and management classes have been established by grouping landforms of like character and by evaluating their uniqueness within the major physiographic region of the Columbia Plateau. Management classes have been determined using the inventory class matrix of the VRM process as derived by scenic quality, sensitivity level, and distance zone determinations from field inventory data. The VRM process is designed to maintain the scenic value of the landscape in its natural condition. The unaltered landscape will be emphasized in the appraisal of scenic worth.

Scenic quality has been rated using BLM Form 8400-1 (1985) Scenic Quality Field Inventory. Select Key Observation Lines (KOL) and Key Observation Points (KOP) have been established for each SQRU at locations most likely to be viewed by visitors. KOL's are located on the rivers edge and include all areas visible from the river. KOP's are selected, publicly accessible, overlooks on the gorge rim. Primary emphasis for scenic quality evaluation has been established with KOL's. Secondary emphasis is established at KOP's. Human modifications have been considered as a factor of scenic quality and have been mapped and identified using BLM Form 8400-2 (1978) Cultural Modification Inventory and Feature Contrast.

Sensitivity levels have been assessed using BLM Form 8400-6 (1985) Sensitivity Level Rating Sheet, BLM Form 8310-8 (1984) Recreation Visitor Survey, documented public concern for the designated area, existing visitor use volume and activity data, and legislative land designations. Public sensitivity has been determined to be greatest at the river's edge where visitor use occurs by foot and viewing time is of greatest duration. Visual vulnerability has been determined to be greatest at overlooks where topographic and vegetative screening is of little effect.Distance zones are identified by foreground/middleground (0-5 miles), background (5-20 miles), and seldom seen (20+ miles) zones. All of the SQRU's are located within the foreground/middleground zone. Background and seldom seen zones are found with Grizzly Mountain 15 miles to the east, and the Cascade Range 40 miles to the west.

Management classes are established as an inventory tool portraying existing visual resources and as a tool for visual management objectives. Management classes are defined by the following:

**Class I** The objective of this class is to preserve the existing character of the landscape. Natural ecological changes and very limited management activities are allowed. However, any change created within the characteristic landscape must not attract attention.

**Class II** The objective of this class is to retain the existing character of the landscape. Changes in any of the basic elements caused by a management activity should not be evident in the characteristic landscape. The level of change should be low and must repeat the basic elements of form, line, color, and texture found in the predominant natural features existing within the landscape. Changes are seen, but do not attract the attention of the casual observer.

**Class III** The objective of this class is to partially retain the existing character of the landscape. Changes to the basic elements caused by a management activity are evident, but should remain subordinate to the existing landscape and should not dominate the view of the casual observer. Changes should be moderate and repeat the basic elements found in the predominant natural features of the landscape.

**Class IV** The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. Changes may be high and attract attention. Activities may be dominant features of the landscape but every attempt should be made to minimize the impact of activities through careful location, minimal disturbance, and repeating the basic elements of the natural features of the landscape.

**Class V** The objective of this class is to provide for areas where activities have disturbed the natural landscape to a point where rehabilitation is needed to bring it up to one of the four other classifications. The level of rehabilitation will be determined by the minimal standards of the desired management class for the area.

## C. SQRU Discussion and Managment Classification

### SQRU 1

| | |
|---|---|
| Scenic Quality: | A |
| Visitor Sensitivity: | High |
| Visitor Attitude: | High |
| Use Volume: | High |
| Distance Zone: | Foreground |

### MANAGEMENT CLASSIFICATION II

Boundaries for this SQRU are delineated by the canyon rim (all lands visible from river) between rivermiles 64.5 and 72.5 excluding the river, campgrounds, gravel quarry, roads and road cuts, and Bowman Dam. SQRU 1 is the primary viewshed found within the WSR corridor.

Scenic quality is rated A based on Scenic Quality Field Inventory data for which the following scenic values exist:

- narrow steep walled canyon
- talus slopes
- cliffs
- geologic, botanical, and wildlife viewing

Visual sensitivity has been determined to be high based on available data including:

- Sensitivity Level Rating Sheet data

- 1991 Recreation Visitor Survey Data
- October 7, 1988 Senate Congressional Record recognizing outstanding scenic values within the Crooked River Gorge
- public support for WSR designation for which the following recreational opportunities exist:
- geological, botanical, and wildlife sightseeing hiking opportunities

**SQRU 2**

| | |
|---|---|
| Scenic Quality: | C |
| Visitor Sensitivity: | High |
| Visitor Attitude: | High |
| Use Volume: | High |
| Distance Zone: | Foreground |

**MANAGEMENT CLASSIFICATION III**

Boundaries for this SQRU are delineated by the river on the west and highway on the east between rivermiles 64.5 and 72.5. This SQRU includes the river and all human features including campgrounds, gravel quarry, highway easement, road cuts and Bowman Dam. SQRU 2 is the high use area of the WSR and is separated as a result of its dissimilar landscape characteristics encompassing existing developments.

Scenic quality is rated C based on Scenic Quality Field Inventory data for which the following scenic values exist:

- slow moving river.
- geologic, botanical, and wildlife viewing

Visual sensitivity has been determined to be high based on available data including:

- Sensitivity Level Rating Sheet data
- public support for WSR designation for which the following recreational opportunities exist:
- developed vehicle camping
- fishing
- boating
- geologic, botanical, and wildlife sightseeing

Note: See the Lower Crooked (Chimney Rock Segment) Campground Inventory, 1991-1992 for detailed photos, maps, and descriptions of campground areas. This document is available for review at the BLM, Prineville District Office.

## SQRU 3

| | |
|---|---|
| Scenic Quality: | A |
| Visitor Sensitivity: | Moderate |
| Visitor Attitude: | Moderate |
| Use Volume: | Low |
| Distance Zone: | Foreground |

## MANAGEMENT CLASSIFICATION III

Boundaries for this SQRU are located between rivermiles 64.5 and 73.5 and include the canyon rim to the east and roads to the west.

Scenic quality is rated A based on Scenic Quality Field Inventory data for which the following scenic values exist:

- scenic overlooks into the gorge
- open space
- old growth juniper woodlands

Visual sensitivity has been determined to be moderate based on available data including:

- Sensitivity Level Rating Sheet data
- portions of SQRU 3 are located within WSR boundaries which have been identified as containing outstandingly remarkable scenic and recreation resource values
- geologic, botanical, and wildlife sightseeing

## SQRU 4

| | |
|---|---|
| Scenic Quality: | A |
| Visitor Sensitivity: | Moderate |
| Visitor Attitude: | Moderate |
| Use Volume: | Low |
| Distance Zone: | Foreground |

## MANAGEMENT CLASSIFICATION III

Boundaries for this SQRU are located between rivermiles 64.4 and 73.5 and include the canyon rim to the west and roads to the east.
Scenic quality is rated A based on Scenic Quality Field Inventory data for which the following scenic values exist:

- scenic overlooks into the gorge
- open space
- old growth juniper woodlands

Visual sensitivity has been determined to be moderate based on available data including:

- Sensitivity Level Rating Sheet data
- portions of SQRU 3 are located within WSR boundaries which have been identified as containing outstandingly remarkable scenic and recreation resource values
- geologic, botanical, and wildlife sightseeing

**SQRU 5**

| | |
|---|---|
| Scenic Quality: | C |
| Visual Sensitivity: | Low |
| Visitor Attitude: | Low |
| Use Volume: | Moderate |
| Distance Zone: | Foreground |

**MANAGEMENT CLASSIFICATION II**

Boundaries for this SQRU are located between rivermile 64.0 and 69.0 including property lines to the west and visual boundaries to the east.

Scenic quality is rated C based on Scenic Quality Field Inventory data for which the following scenic values exist:

- foreground views from adjacent SQRU's

Visual sensitivity has been determined to be low based on available data including:

- Sensitivity Level Rating Sheet data
- present condition of land
- low viewing time of land

# *Appendix F*

## *Lower Crooked River Campground Inventory 1991-92*

*The following represents a summary of data derived from the Lower Crooked River Campground Inventory for known/existing major use campsites. A detailed analysis of existing campsites can be found within the Lower Crooked River Resource Assessment which is available at the BLM, Prineville District Office.*

Ratings for LAC, FAC, and AR are breifly defined below.

**Limits of Acceptable Change (LAC):**

L Light use
M Moderate use with some minor resource impacts
H Heavy use with repairable major resource impacts
E Extreme use with extreme resource impacts not repairable without temporary closure of the site

**Facilities (FAC):**

3 Water plus facilities listed below
2 Toilet, garbage disposal, tables, and fire rings
1 Toilet and one of the other two features
0 Toilet or table only
1 No facilities available except garbage cans possibly

**Acceptability Rating (AR):**

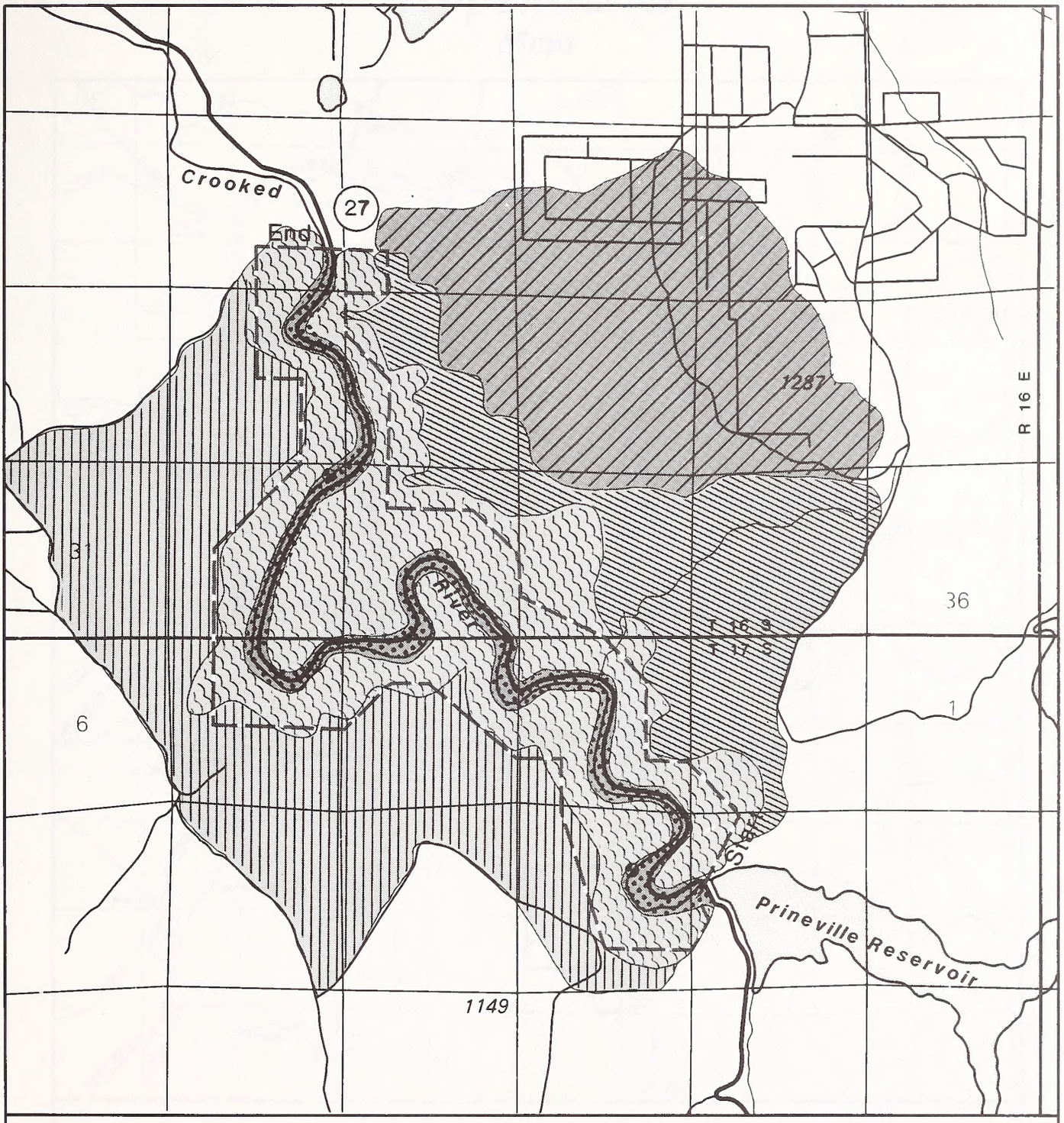
H High - Visitors would prefer to use these sites over others
M Moderate - Sites moderatly used by visitors
L Low - These sites would be used more for overflow purposes

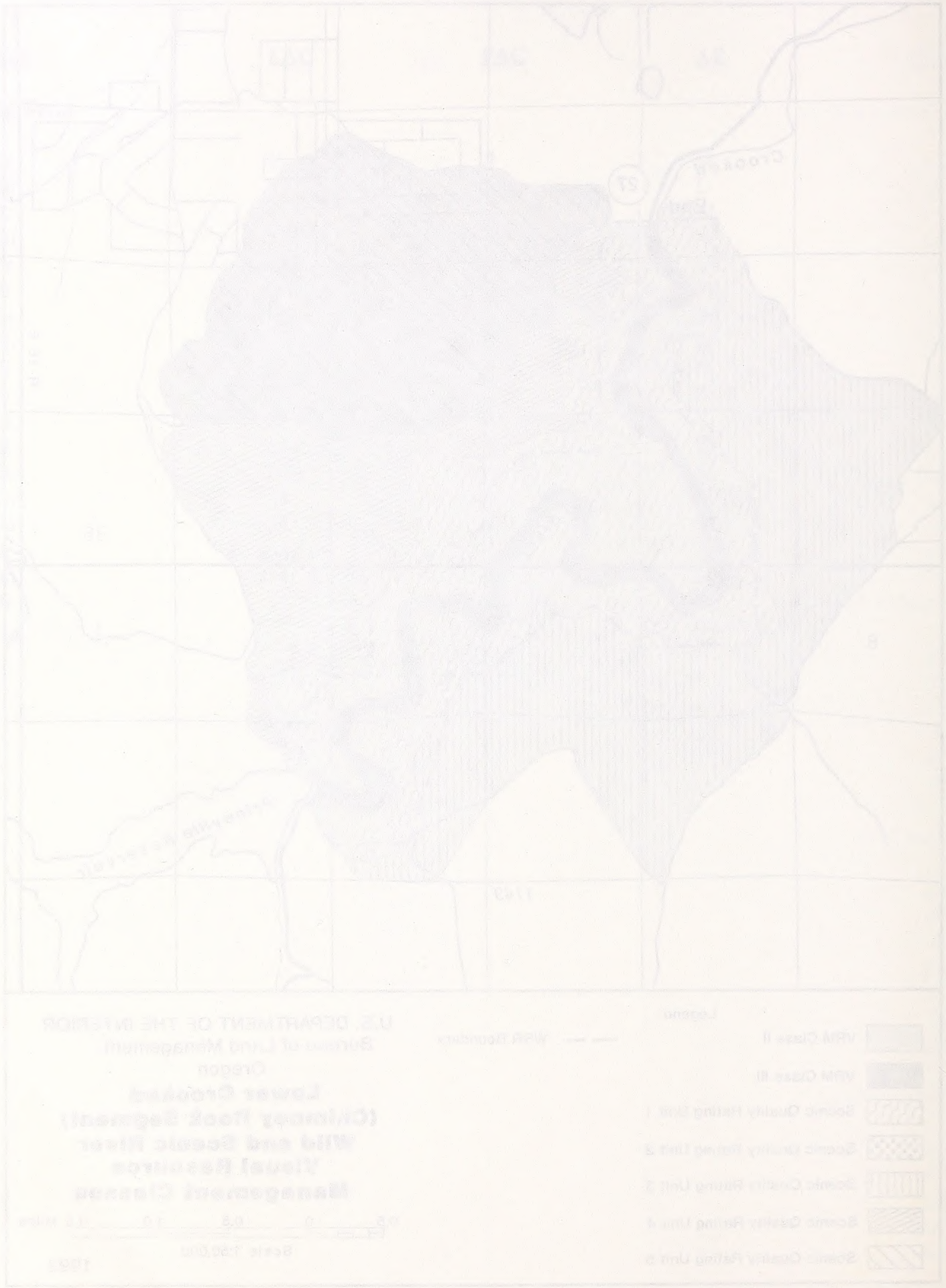
| SITE | LAC | FAC | AR |
|---|---|---|---|
| **Castle Rock** | | | |
| 1a | L | 1 | M |
| 1b | H | 2 | H |
| 1c | M | 2 | H |
| 1d | M | 2 | H |
| 1e | M | 2 | H |

| SITE | LAC | FAC | AR |
|---|---|---|---|
| **Stillwater** | | | |
| 2a | M | 2 | H |
| 2b | M | 2 | H |
| 2c | M | 2 | H |
| 2d | M | 2 | H |
| 2e | M | 2 | H |
| 2f | M | 1 | H |
| 2g | M | 2 | H |
| 2h | M | 2 | H |
| **Greenwood** | | | |
| 3a | M | 1 | H |
| 3b | M | 2 | H |
| 3c | M | 1 | H |
| 3d | M | 1 | M |
| 3e | M | 1 | H |
| 3f | M | 1 | L |
| **Lone Pine** | | | |
| 4a | M | 2 | H |
| 4b | M | 2 | H |
| 4c | M | 2 | H |
| 4d | M | 2 | H |
| 4e | M | 2 | H |
| 4-1 | M | 1 | M |
| 4-2 | M | 0 | H |
| 4-3 | M | 1 | H |
| **Lower Palisades** | | | |
| 5a | M | 2 | H |
| 5b | M | 2 | H |
| 5c | M | 2 | H |
| 5d | M | 2 | H |
| 5e | M | 2 | H |
| 5-1 | M | 0 | M |
| 5-2 | M | 1 | H |
| 5-3 | M | 1 | H |
| 5-4 | M | 1 | L |
| 5-5 | M | 1 | M |
| 5-6 | M | 1 | M |
| 5-7 | M | 1 | M |

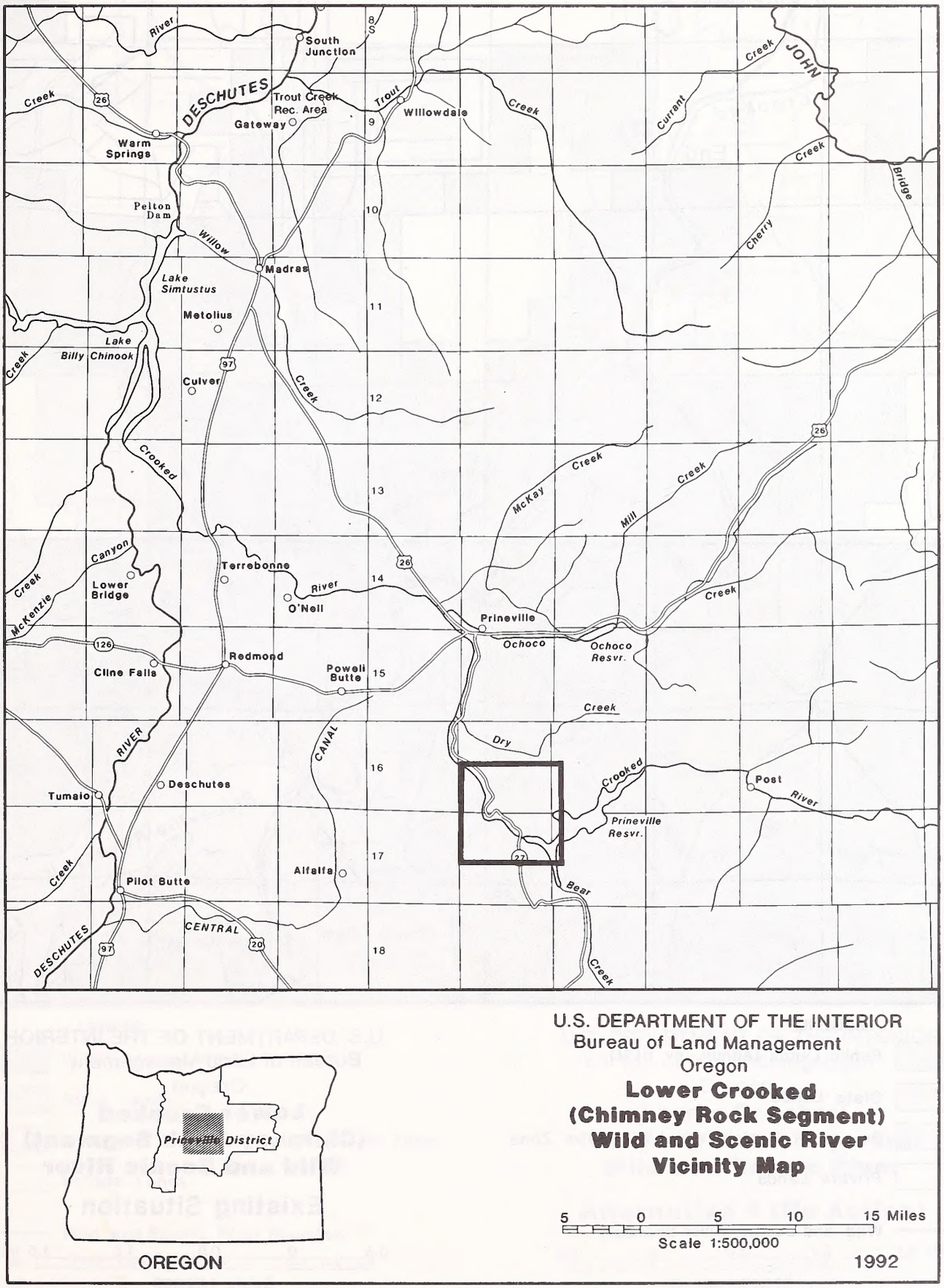
| SITE | LAC | FAC | AR |
|---|---|---|---|
| **Chimney Rock** | | | |
| 6a | M | 3 | H |
| 6b | M | 3 | H |
| 6c | M | 3 | H |
| 6d | M | 3 | H |
| 6e | M | 3 | H |
| 6f | M | 3 | H |
| 6g | M | 3 | H |
| 6h | M | 3 | H |
| 6i | M | 3 | H |
| 6j | M | 3 | H |
| 6k | M | 3 | H |
| 6l | M | 3 | M |
| 6m | M | 3 | H |
| 6n | M | 3 | H |
| 6o | M | 3 | H |
| 6p | M | 3 | H |
| **Cobble Rock** | | | |
| 7a | M | 1 | H |
| 7b | M | 2 | H |
| 7c | M | 1 | H |
| 7d | M | 0 | H |
| 7e | M | 1 | H |
| 7f | M | 1 | H |
| **Post Pile** | | | |
| 8a | M | 2 | H |
| 8b | M | 2 | H |
| 8c | M | 2 | H |
| 8d | M | 2 | H |
| 8e | M | 2 | H |
| 8f | M | 2 | H |
| 8g | M | 2 | H |
| **Poison Butte** | | | |
| 9a | M | 2 | H |
| 9b | M | 2 | H |
| 9c | M | 2 | H |
| 9d | M | 2 | H |
| 9e | M | 2 | H |

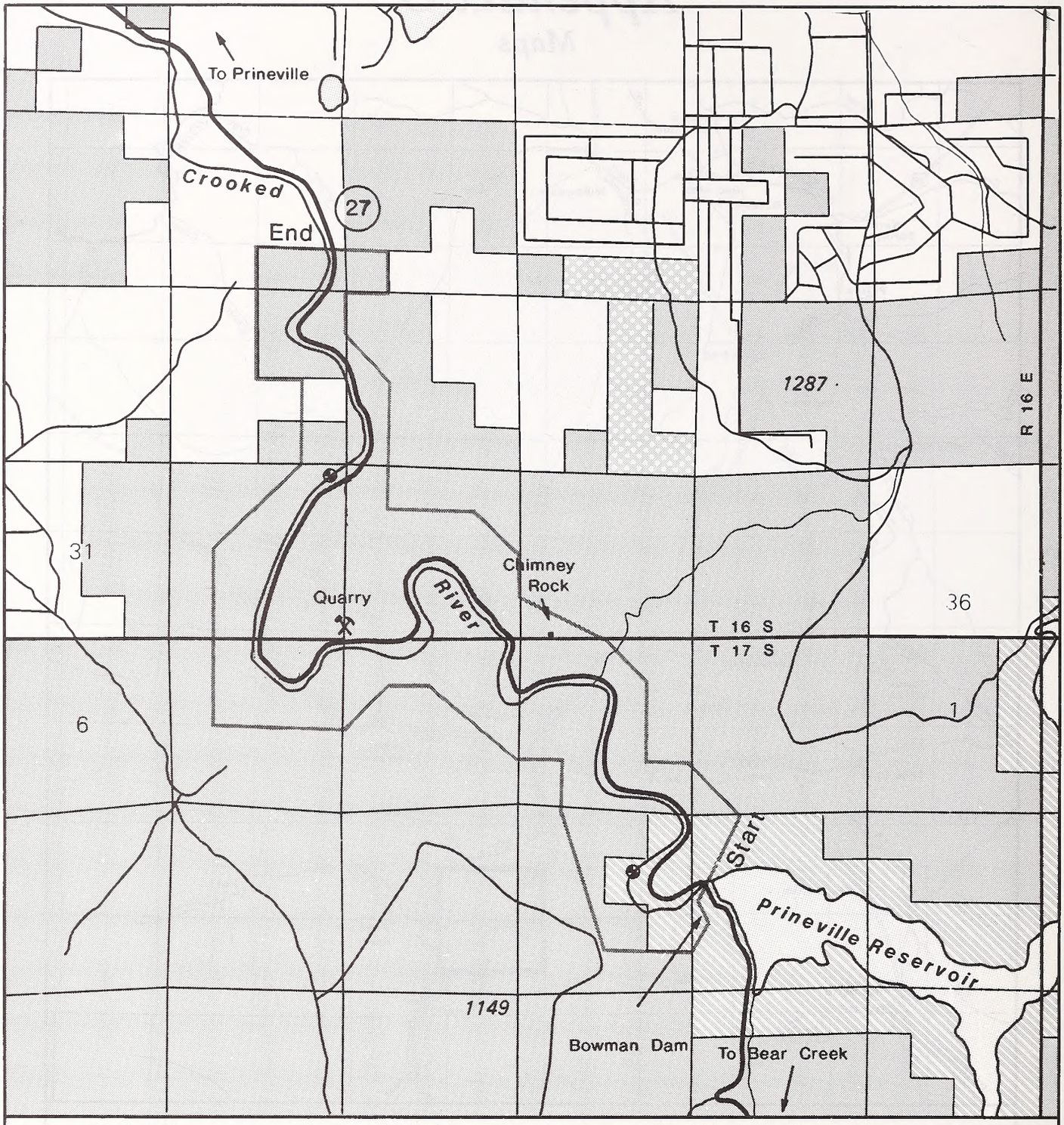
| SITE | LAC | FAC | AR |
|---|---|---|---|
| **Big Bend** | | | |
| 10a | L | 1 | M |
| 10b | M | 1 | L |
| 10c | M | 1 | M |
| 10d | M | 1 | M |
| 10e | M | 1 | M |
| 10f | M | 1 | H |
| 10g | M | 1 | M |
| 10h | M | 1 | H |
| 10i | M | 1 | M |
| 10j | M | 1 | M |
| 10k | M | 1 | L |
| 10l | M | 1 | M |
| 10m | M | 1 | M |
| 10n | M | 1 | H |
| 10o | M | 1 | H |
| 10p | M | 1 | H |
| 10q | M | 1 | L |
| 10r | M | 1 | L |

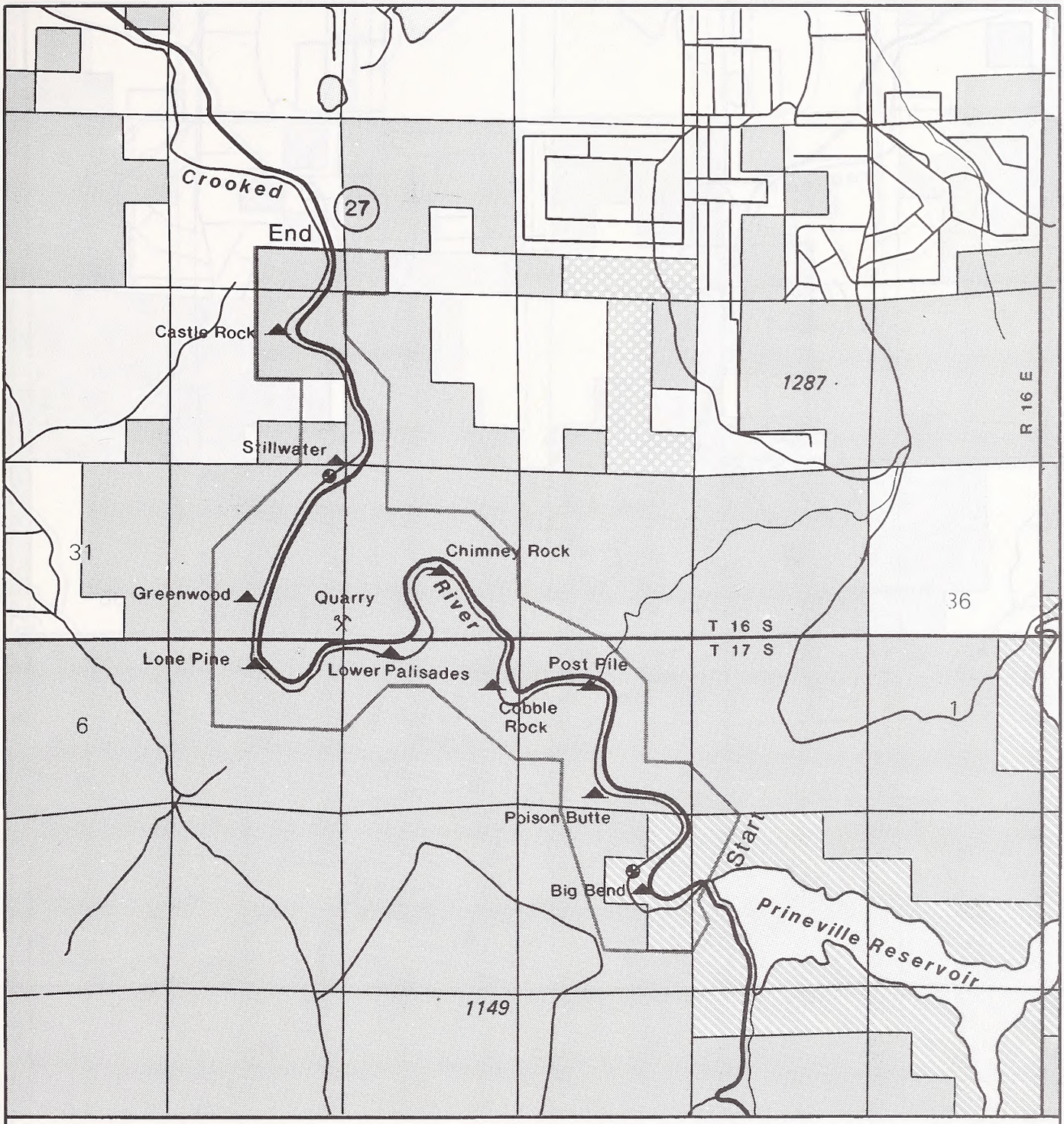

Crooked
End
27
1287
R 16 E
31
36
River
T 16 S
T 17 S
6
1
Prineville Reservoir
1149
Legend
VRM Class II
VRM Class III
Scenic Quality Rating Unit 1
Scenic Quality Rating Unit 2
Scenic Quality Rating Unit 3
Scenic Quality Rating Unit 4
Scenic Quality Rating Unit 5
WSR Boundary
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Oregon
Lower Crooked
(Chimney Rock Segment)
Wild and Scenic River
Visual Resource
Management Classes
0.5 0 0.5 1.0 1.5 Miles
Scale 1:50,000
1992

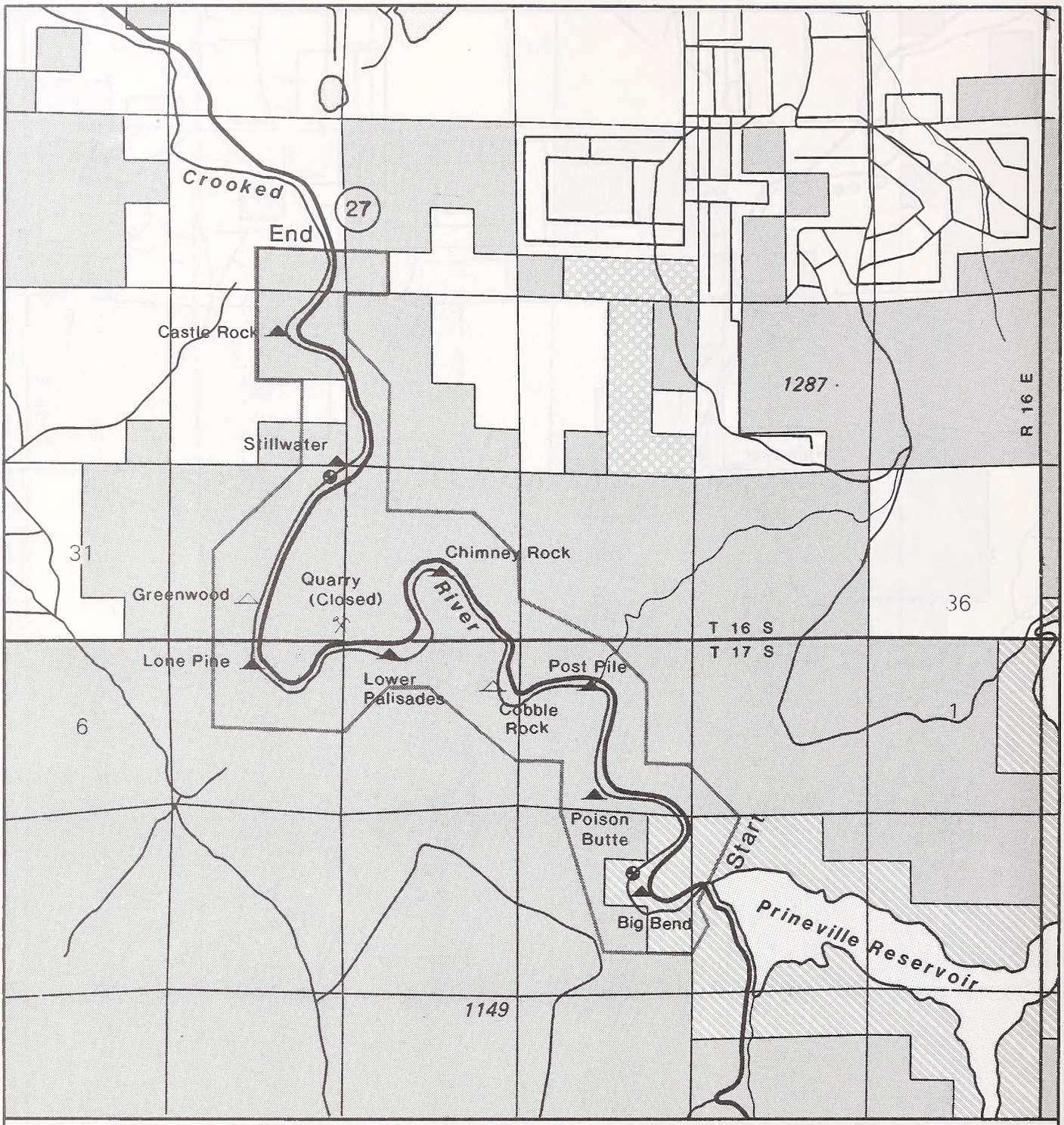


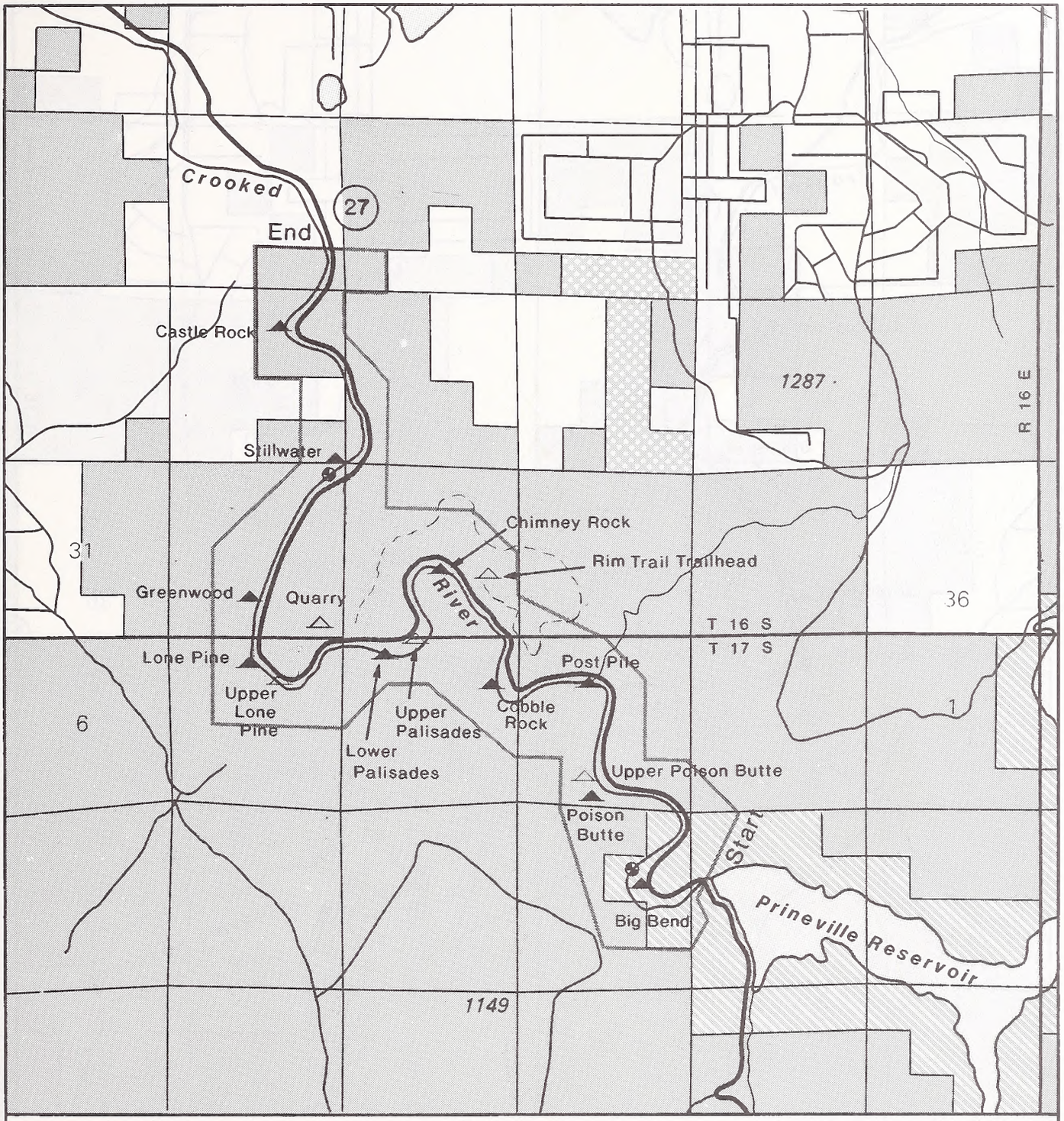
# *Appendix G*
## *Maps*

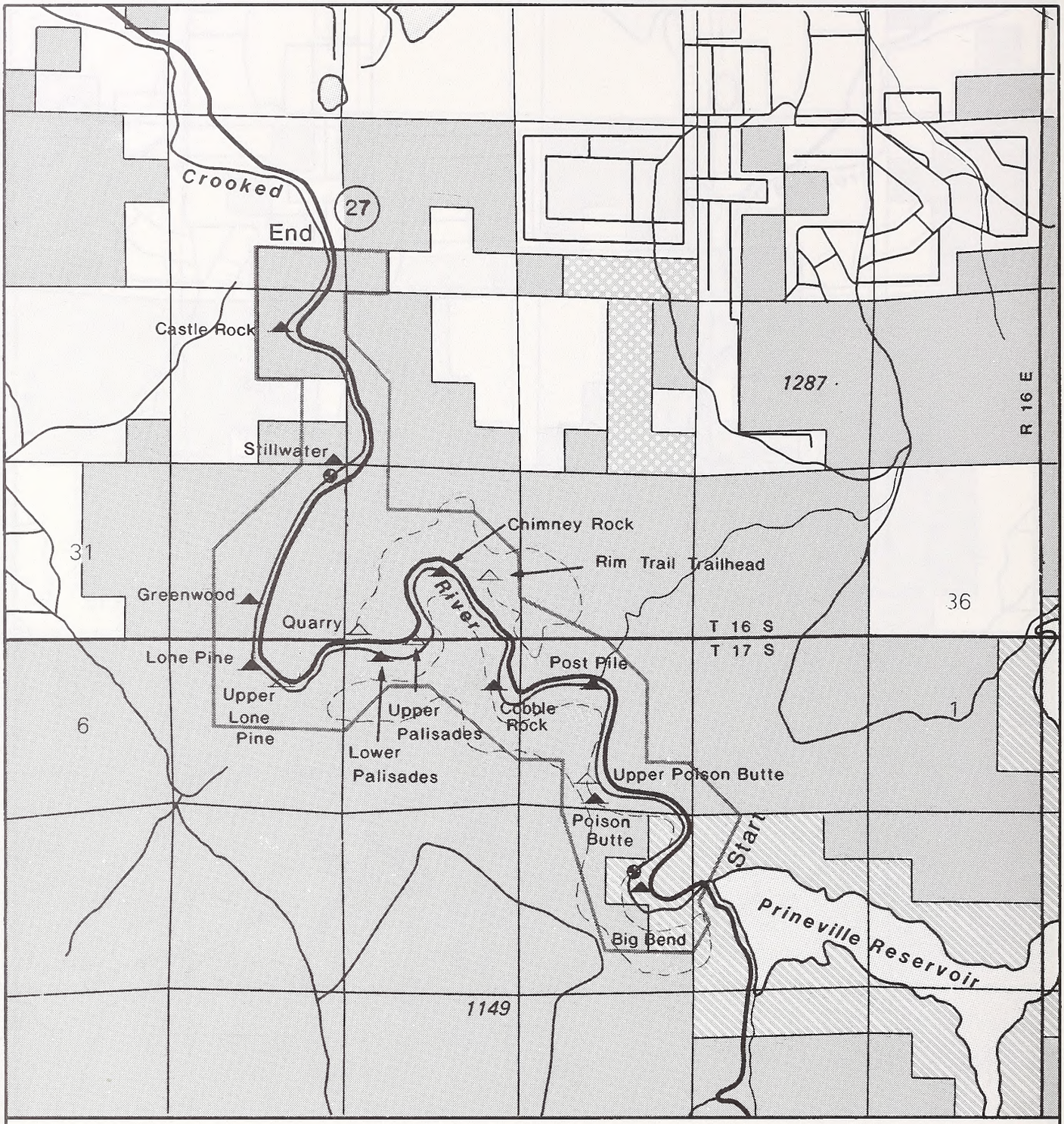


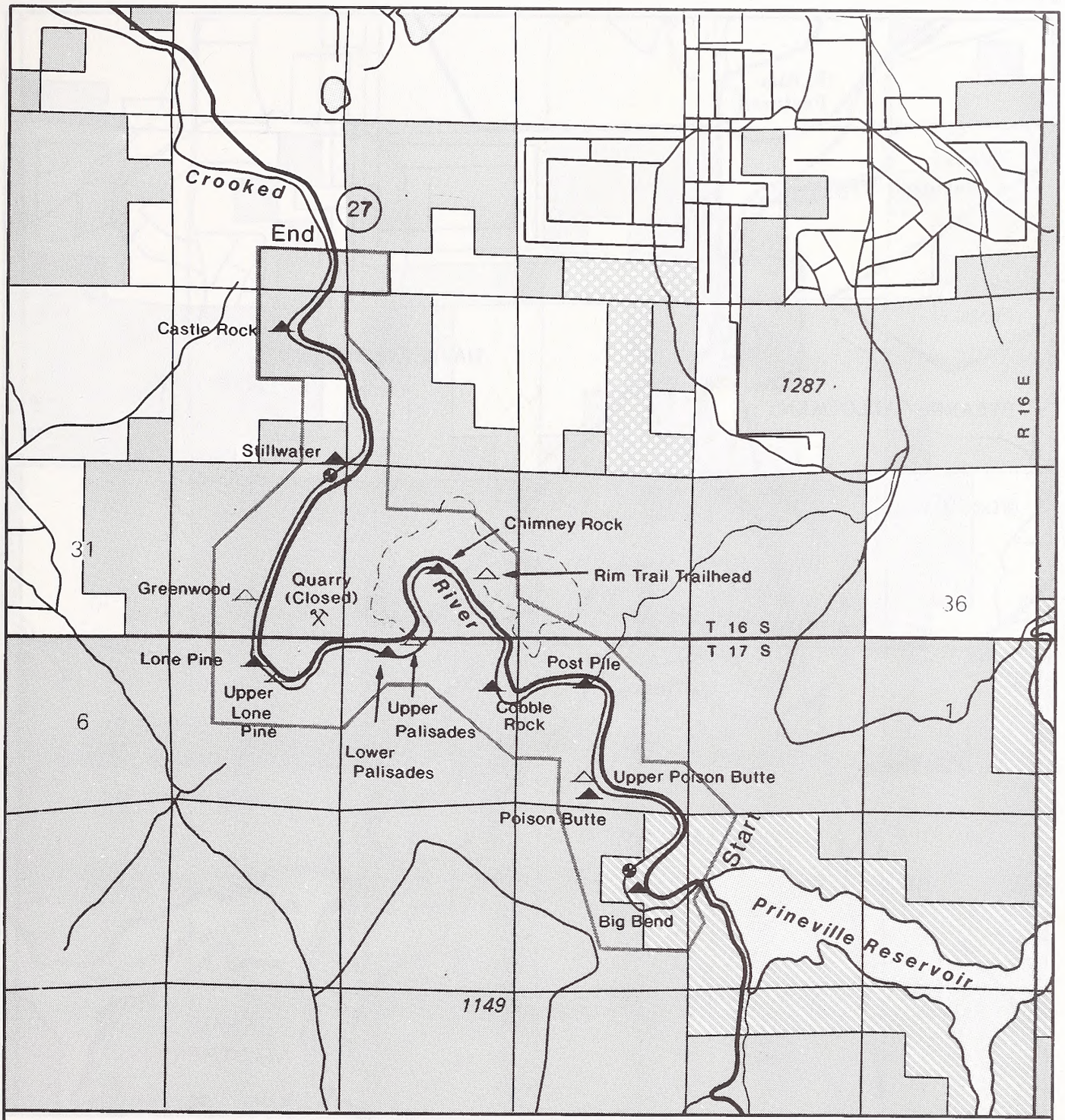

To Prineville
Crooked
End
27
1287
R 16 E
31
Quarry
River
Chimney
Rock
36
T 16 S
T 17 S
6
1
Start
Prineville Reservoir
1149
Bowman Dam
To Bear Creek
LEGEND
Public Lands (Admin. by BLM)
State Lands
Bureau of Reclamation / Withdrawn Zone
Private Lands
Wild and Scenic River Boundary
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Oregon
Lower Crooked
(Chimney Rock Segment)
Wild and Scenic River
Existing Situation
0.5 0 0.5 1.0 1.5 Miles
Scale 1:50,000
1992

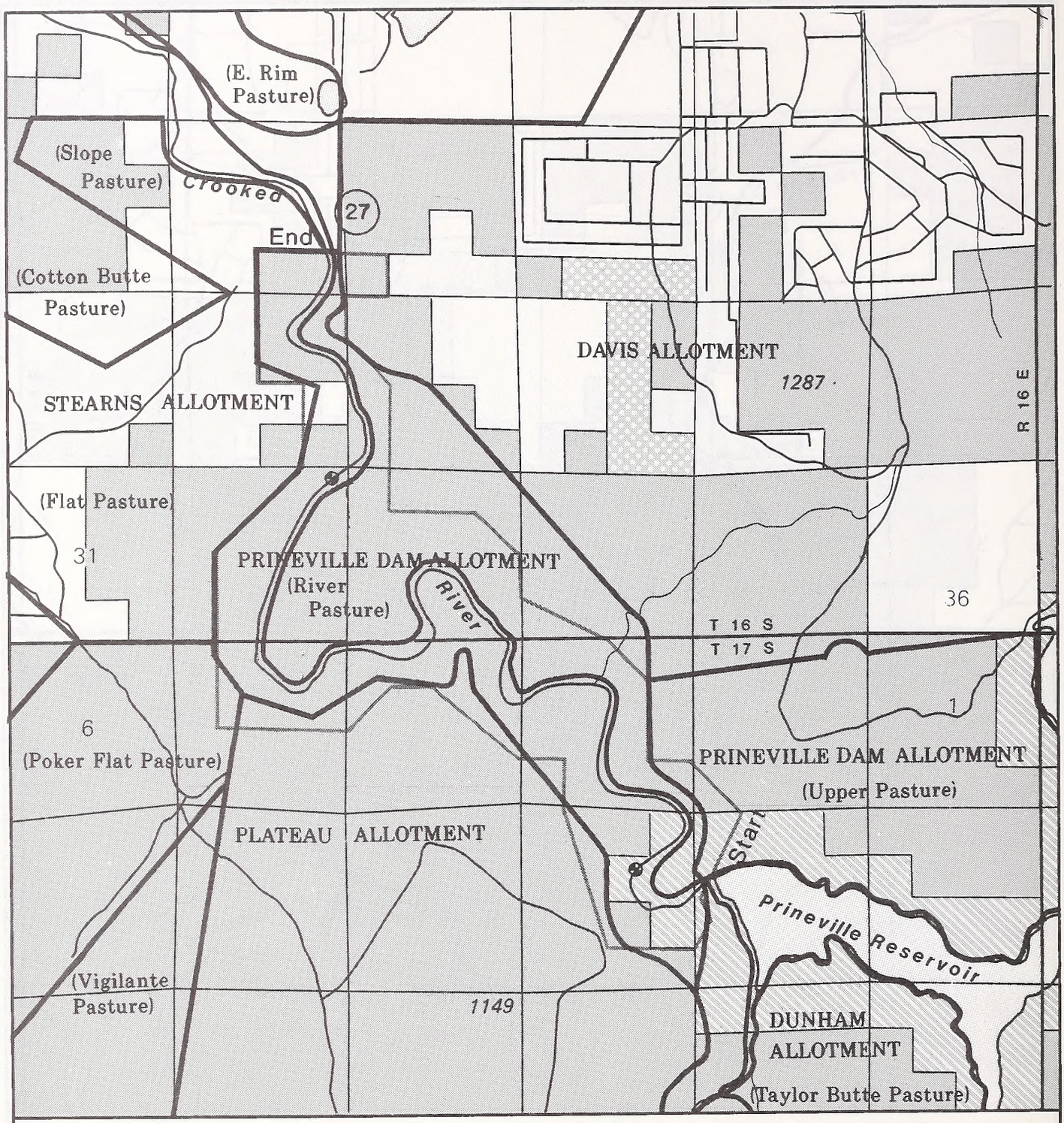

Crooked
End
27
Castle Rock
Stillwater
1287
R 16 E
31
Chimney Rock
Greenwood
Quarry
River
36
T 16 S
T 17 S
Lone Pine
Lower Palisades
Post Pile
Cobble Rock
6
1
Poison Butte
Start
Big Bend
Prineville Reservoir
1149
LEGEND
Public Lands (Admin. by BLM)
State Lands
Bureau of Reclamation / Withdrawn Zone
Private Lands
Wild and Scenic River Boundary
Overnight Camping
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Oregon
Lower Crooked
(Chimney Rock Segment)
Wild and Scenic River
Alternative 1 (No Action)
0.5 0 0.5 1.0 1.5 Miles
Scale 1:50,000
1992


Crooked
End
27
Castle Rock
Stillwater
1287
R 16 E
31
Chimney Rock
Quarry
(Closed)
Greenwood
River
36
T 16 S
T 17 S
Lone Pine
Lower
Palisades
Post Pile
Cobble
Rock
6
1
Poison
Butte
Start
Big Bend
Prineville Reservoir
1149
LEGEND
Public Lands (Admin. by BLM)
State Lands
Bureau of Reclamation / Withdrawn Zone
Private Lands
Wild and Scenic River Boundary
Overnight Camping
Day Use Area
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Oregon
Lower Crooked
(Chimney Rock Segment)
Wild and Scenic River
Alternative 2
0.5 0 0.5 1.0 1.5 Miles
Scale 1:50,000
1992


Crooked
End
27
Castle Rock
1287
R 16 E
Stillwater
Chimney Rock
Rim Trail Trailhead
31
Greenwood
Quarry
River
36
T 16 S
T 17 S
Lone Pine
Upper Lone Pine
Upper Palisades
Lower Palisades
Cobble Rock
Post Pile
6
1
Upper Poison Butte
Poison Butte
Start
Big Bend
Prineville Reservoir
1149
LEGEND
Public Lands (Admin. by BLM)
State Lands
Bureau of Reclamation / Withdrawn Zone
Private Lands
Wild and Scenic River Boundary
Overnight Camping
Day Use Area
Proposed Upland Trails
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Oregon
Lower Crooked
(Chimney Rock Segment)
Wild and Scenic River
Alternative 3
0.5 0 0.5 1.0 1.5 Miles
Scale 1:50,000
1992


Crooked
End
27
Castle Rock
Stillwater
1287
R 16 E
Chimney Rock
Rim Trail Trailhead
31
Greenwood
Quarry
River
36
T 16 S
T 17 S
Lone Pine
Post Pile
Upper Lone Pine
Upper Palisades
Cobble Rock
6
1
Lower Palisades
Upper Poison Butte
Poison Butte
Prineville Reservoir
Big Bend
1149
LEGEND
Public Lands (Admin. by BLM)
State Lands
Bureau of Reclamation / Withdrawn Zone
Private Lands
Wild and Scenic River Boundary
Overnight Camping
Day Use Area
Proposed Upland Trails
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Oregon
Lower Crooked
(Chimney Rock Segment)
Wild and Scenic River
Alternative 4
0.5 0 0.5 1.0 1.5 Miles
Scale 1:50,000
1992


Crooked
End
27
Castle Rock
1287
R 16 E
Stillwater
Chimney Rock
31
Rim Trail Trailhead
Greenwood
Quarry
(Closed)
River
36
T 16 S
T 17 S
Lone Pine
Post Pile
Upper
Lone
Pine
Upper
Palisades
Cobble
Rock
6
1
Lower
Palisades
Upper Poison Butte
Poison Butte
Start
Big Bend
Prineville Reservoir
1149
LEGEND
Public Lands (Admin. by BLM)
State Lands
Bureau of Reclamation / Withdrawn Zone
Private Lands
Wild and Scenic River Boundary
Overnight Camping
Day Use Area
Proposed Upland Trails
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Oregon
Lower Crooked
(Chimney Rock Segment)
Wild and Scenic River
Preferred Alternative
0.5 0 0.5 1.0 1.5 Miles
Scale 1:50,000
1992



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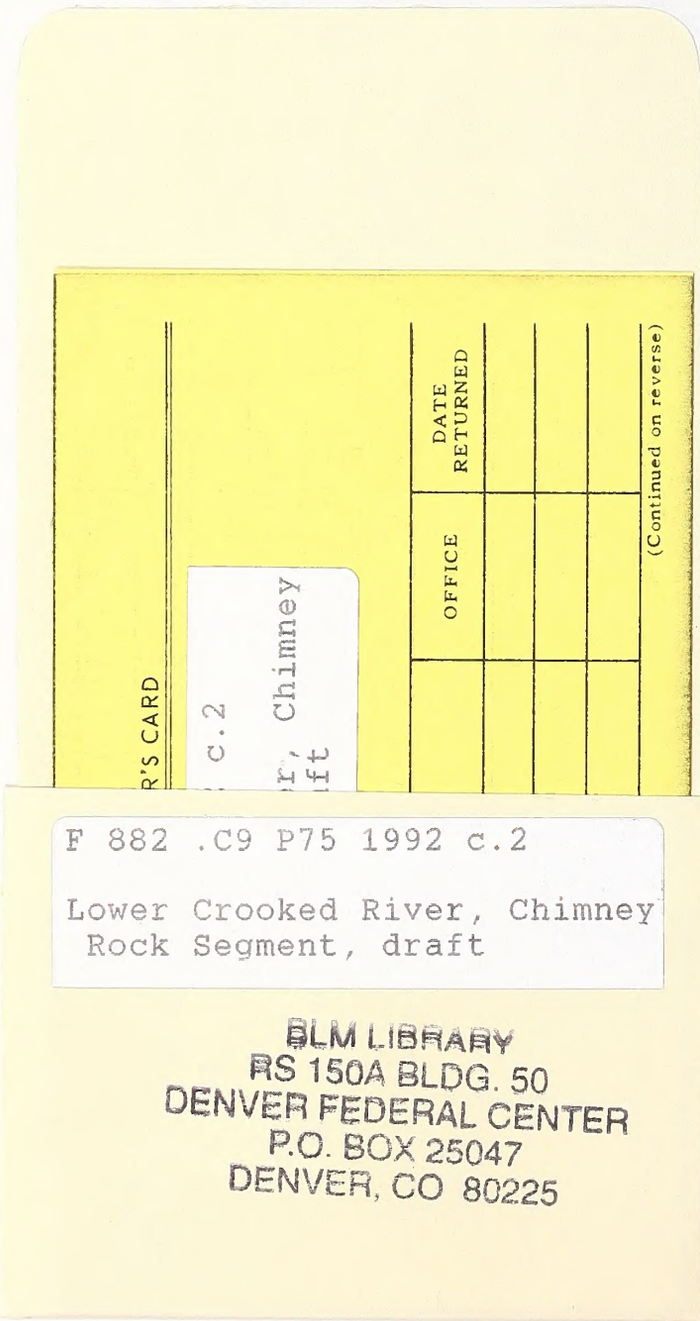

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**BUREAU OF LAND MANAGEMENT**
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